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ABSTRACT

This task-oriented manual for the training of community health workers in nutrition presents information and instructions in two parts. The first part consists of three chapters. The first chapter introduces the guidelines; the second deals with teaching skills and is intended to improve teaching. The third chapter presents some basic facts about foods to help trainers focus on the nutritional knowledge community health workers will need in order to work effectively. The second part of the manual contains nine training modules. Each module deals with one topic and describes specific tasks related to it. The modules cover the following topics: (1) getting to know the community and its needs; (2) measuring and monitoring the growth and nutrition of children; (3) promotion of breast feeding; (4) nutritional advice on the feeding of infants and young children; (5) nutritional care of mothers; (6) identification, management, and prevention of common nutritional deficiencies; (7) nutritional care during diarrhea and other common infections; (8) conveying nutrition messages to the community; and (9) solving nutritional problems in the community. Each module contains learning objectives, training content, training methods, and exercises. Common teaching aids and teaching methods are presented in tabular form together with information on their advantages, limitations, and specific applications. (KC)

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GUIDELINES FOR TRAINING COMMUNITY HEALTH WORKERS IN NUTRITION

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WORLD HEALTH ORGANIZATION GENEVA

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The World Health Organization is a specialized agency of the United Nations with primary responsibility for international health matters and public health. Through this organization, which was created in 1948, the health professions of some 165 countries exchange their knowledge and experience with the aim of making possible the attainment by all citizens of the world by the year 2000 of a level of health that will permit them to lead a socially and economically productive life.

By means of direct technical cooperation with its Member States, and by stimulating such cooperation among them, WHO promotes the development of comprehensive health services, the prevention and control of diseases, the improvement of environmental conditions, the development of health manpower, the coordination and development of biomedical and health services research, and the planning and implementation of health programmes.

These broad fields of endeavour encompass a wide variety of activities, such as developing systems of primary health care that reach the whole population of Member countries; promoting the health of mothers and children; combating malnutrition; controlling malaria and other communicable diseases including tuberculosis and leprosy; having achieved the eradication of smallpox, promoting mass immunization against a number of other preventable diseases; improving mental health; providing safe water supplies; and training health personnel of all categories.

Progress towards better health throughout the world also demands international cooperation in such matters as establishing international standards for biological substances, pesticides and pharmaceuticals; formulating environmental health criteria; recommending international non-proprietary names for drugs; administering the International Health Regulations; revising the International Classification of Diseases, Injuries, and Causes of Death; and collecting and disseminating health statistical information.

Further information on many aspects of WHO's work is presented in the Organization's publications.

Other useful WHO training materials:

1. *Nutrition learning packages*. Geneva, World Health Organization (in press).
2. *The community health worker*. Geneva, World Health Organization, 1987.
3. *Treatment and prevention of acute diarrhoea. Guidelines for the trainers of health workers*. Geneva, World Health Organization, 1985.
4. *The growth chart: a tool for use in infant and child health care*. Geneva, World Health Organization, 1986.

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Guidelines for Training Community Health Workers in Nutrition

Second edition

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GENEVA
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Preface to first edition

The trainers of community health workers for whom this book is primarily intended will probably already know the technical information on nutrition that it contains. Many of them, however, will not be familiar with the task-oriented approach that is adopted here. It is hoped that they will find this book useful either for preparing and carrying out a new nutrition training plan or for revising an existing plan to make it more practical and effective. Supervisors will find much in these pages to help them in the guidance and on-the-job training of community health workers under their supervision. The community health worker who has completed training based on this manual can also use it for reference and as a continuing guide to help her in her daily contacts with families. Finally, this book explains the basic nutrition tasks of the community health worker to other health and development workers in the community. It will serve them all as a guide in determining the areas in which they can work together to solve the nutritional, health and related problems that are their common concern.

Preface to second edition

After its publication in 1981, the first edition of this book was field-tested in a number of training centres for community health workers in developing countries. This second edition has been prepared by Dr K. Bagchi on the basis of this experience. In addition, many trainers from both developed and developing countries who used the first edition sent in suggestions for improvement independently, and this edition also includes their recommendations. The World Health Organization is grateful to all of them.

The first part of this book consists of three chapters that should be read by all trainers. The first introduces the guidelines; the second deals with teaching skills, and is intended to help trainers teach better; those who are not formally trained as teachers will find it useful to study the teaching methods described. The third chapter presents some basic facts about foods to help trainers focus on the basic nutritional knowledge community health workers will need in order to work effectively.

The second part of the book contains the training modules. Each module deals with one topic and describes specific tasks related to it. The modules in this edition are essentially the same as those in the previous edition, though some of them have been modified considerably. In most cases, the training content has been made shorter. The modules on nutrition and diarrhoea and nutrition and infections in the previous edition have been condensed into one module in this edition. The last module is new and contains useful practical information on how to apply all the knowledge learnt during training to the nutritional problems in the real-life community situation.

This book should be used as a model, and national trainers must adapt it to suit local needs by introducing locally relevant examples of nutritional problems and exercises. (A new WHO publication, still in press at the time of writing, *Nutrition learning packages*, describes useful activities and contains material for adaptation.) This has already been done with the previous edition, which now exists in several languages including Arabic, Burmese, French, Hindi, Malay, Spanish, and Thai. We hope that this revised edition will prove even more useful than the first.

Dr Alberto Pradilla
Chief, Nutrition, WHO, Geneva

Chapter 1

Introduction

Malnutrition

In most developing countries the majority of the population—the rural population especially—does not receive even the most basic health care or any nutritional advice. Malnutrition usually stems from poverty and from ignorance of what are the right foods to eat. At the same time it increases the problems caused by the lack of health care because it weakens the body's defences against disease. People weakened by malnutrition and disease do not have the energy to overcome poverty and are helpless to improve their own situation. Malnutrition, therefore, is not merely one of the greatest public health problems in the world today, it is also both a result and a cause of social and economic underdevelopment.

The root of the problem is in the home: to solve it, the family must be helped to learn better habits of nutrition and must be served by better health care. In an increasing number of countries, the person responsible for health care at the family level is the community health worker. In a primary health care system, she[1] occupies a key position, being the first point of contact that the family has with the health services. It is she who first treats the members of the family for their illnesses and who gives them advice on health matters. It is essential, therefore, that she should be properly trained to deal with the most prevalent health problem she is likely to meet—namely, malnutrition.

[1] The community health worker is referred to as "she" in this book because in most developing countries many such workers are responsible for health work concerned with maternal and child care and nutrition. Male community workers are usually responsible for community development work such as food production, water supply, and sanitation.

The community health worker's nutrition tasks

There are many tasks she will have to perform to overcome the malnutrition problem. Studies conducted in recent years by the World Health Organization and others have shown that the majority of these tasks are common to community work in most developing countries. They can be grouped into eight main categories—namely:

- Getting to know the community needs
- Measuring and monitoring the growth and nutrition of children
- Promoting breast-feeding
- Giving nutritional advice on feeding infants and young children
- Giving nutritional advice to mothers
- Identifying, managing, and preventing nutritional deficiencies
- Providing nutritional care during common infections
- Conveying nutritional messages to the community.

The need for a change in nutrition training

The training in nutrition that the community health worker receives commonly suffers from three main defects.

First, because nutrition trainers are often professionals from different disciplines (doctors, nutritionists, or nurses, for example), they naturally tend to teach what they themselves learned during their own professional training. This often leads to the training being biased towards the profession of the trainer and being aimed at too high a level of learning. A doctor, for instance, may attempt to make his trainees learn details of the clinical aspects of nutrition that a community health worker does not really need to know and may not be able to understand. Moreover, the training

frequently relies too much on learning technical information from textbooks and not enough on learning how to deal with practical problems of nutrition.

Secondly, the training is based mainly on lectures, during which the trainees remain passive listeners. There is no exchange of ideas between them and the lecturer that would help them remember the information he is attempting to pass on. *Thus, lecturing is not always the best method of conveying information to the trainees.*

Thirdly, there is a lack of simple training material designed specifically to teach community health workers how to perform certain tasks. *Most manuals on nutrition concentrate on technical aspects of the subject.* They do not specify the tasks the trainees will be expected to perform. They do not explain how the training should be conducted so that the trainees learn the necessary skills. And they do not indicate how to check whether the trainees have in fact learned those skills.

The purpose of these guidelines

The guidelines presented here have been prepared to help trainers overcome these problems. They are designed to train a community health worker to improve nutrition in her area by learning in a practical way the most important things she will need to know and do.

They are based on the following main considerations:

1. The training should be directed to the *performance of specific tasks*. These are the activities that the community health worker will need to carry out in order to deal with the nutritional problems in her area. The performance of these tasks requires certain skills; and these skills in turn have to be based on a knowledge of certain facts. For instance, if a child has diarrhoea the community health worker needs to know that the loss of water and salts from the body is dangerous and that this loss must be replaced by a special solution of salts and sugar in water. She also needs to be able to prepare the solution and feed it to the child, and to convey to the mother the importance of this task so that the mother can do it herself next time.

2. The community health worker should be trained to perform *a limited number of practical tasks* for the improvement of health and nutrition. The amount of theoretical information given during the training can be restricted to the minimum necessary for understanding the importance of those tasks.

3. To be fully effective, training requires the *maximum participation* by the trainees themselves. This can be achieved by what is called the "teaching–learning" method. It differs from conventional teaching in that it is more concerned with stimulating a trainee to acquire the knowledge she needs to perform a task successfully than with simply transferring knowledge from a teacher to a pupil. Using the modules in this book, the trainee will participate actively in her own training.

4. It is very important for the trainees to have a strong *motivation* to learn their job and to serve the community. This should be taken into account when selecting persons for training as community health workers. During the training period, the trainer should try to increase this motivation, in order to encourage the trainees to learn better and to help them to do their community work effectively.

5. As far as possible, the *training should be given near the community* in which a trainee will be working later. It is much easier for her to understand the problems she is learning to solve if she can relate them to the actual conditions she will meet in the community.

6. The trainees will have to acquire certain knowledge and skills that may not seem to be directly related to the technical aspects of nutrition. This is because *the whole community must participate* as much as possible in solving their own problems if activities or programmes to improve nutrition are to be successful. The community health worker will need, for instance, to be able to communicate with the community, to motivate and organize community groups to solve their own problems, to show leadership, and to analyse problems before proposing solutions for them.

7. The *duration* of the training will depend upon the educational background of the trainees, upon how many tasks they will be expected to perform, and upon how complicated these are.

8. Training is *not necessarily completed in a set period of time* or at the end of the formal training course. The supervisor will need to judge how effectively a community health worker is doing her job, to see what further training she may need, and to help her to acquire that training. This should be an encouragement to the community health worker to improve the service she can give. Refresher training at regular intervals will

increase the effectiveness of community health workers.

How trainers may use these guidelines

Trainers who wish to develop nutrition training plans for community health workers for the first time may do so by following the steps listed in the next chapter. For the training itself they may use the modules given in the second part of this book. Depending on the situation in the local communities and on the qualifications of their trainees, one or more of the modules may need to be adapted to suit local conditions, customs, and resources. The length of the training period can be set when this has been done.

> These guidelines provide a model of a nutrition training plan—the trainer should modify them to suit local needs.

Each of the training modules deals with one topic and describes tasks associated with it. For example, Module 2 is entitled "Measuring and monitoring the growth and nutrition of children". To carry out the tasks described in each module, community health workers will have to learn several subtasks. It should be noted that a community health worker will not necessarily perform all the tasks described in the guidelines every day. Rather, her daily activities will depend upon the type of nutritional problems in the community she is serving. Furthermore, nutritional problems in a community often vary with time.

The subtasks in each module form the *learning objectives*, which are given at the beginning of each module. For example, the learning objectives of Module 2 are:

- Explain the relationship between growth, development, and nutrition
- Find out the age of a child by using a local-events calendar if the mother is not sure of the age of her child
- Weigh a child accurately to within 100 grams
- Record the weight of a child on a growth chart
- Explain to the mother the features of the growth chart and how it will help her decide whether or not the child is doing well
- Interpret a child's growth pattern from the weight changes recorded.

The learning objectives also indicate what tasks a community health worker will be able to perform after the training is over.

The second section of each training module is entitled *Training content*. This section contains the basic training information about each module. After learning the training content the trainees should be able to:

- Understand why the task described in the title of the module is important
- Understand what subtasks and skills are required for carrying out that task
- Carry out the subtasks and practise the skills.

In this section, the training material is arranged in the same order as the learning objectives. The training content also describes the *skills* which must be acquired in order to carry out specific tasks. For example, the training content relating to the task of nutritional monitoring of young children describes in detail what a growth chart looks like, how the chart is to be used, how to weigh a child accurately, how to assess the correct age of the child, how to record the weight on the chart, and so on. In other words, the training material imparts the knowledge necessary to understand the importance of specific tasks, and also describes the skill required for each.

At the end of each section on training material there is a list of *training methods* suitable for that particular module. Here again, the trainer should remember that these are only examples and that other methods may be used if they are found to be more suitable for the trainees in a particular training situation.

The last section of each module presents practical exercises. These can be used in two ways. The trainees can use them as practical tasks to practise skills. And the trainers can use them as practical tests to assess how well the trainees have learnt the skills. As explained earlier the exercises are based on different training methods. Some involve practical work (for example, weighing a baby) and certain others are based on community survey work. In addition, there are some role-playing exercises for practising and testing communication skills. It should be noted that the *exercises given in this book are only examples*. Trainers are advised to devise, if necessary, new exercises that suit local conditions and customs better.

Chapter 2

Teaching for better learning

The purpose of teaching is to facilitate learning. This is not an easy task. Teaching is commonly perceived as standing before a group of students and lecturing. Although this method of teaching is useful in certain situations, it is not always the best method of imparting information. Experience has shown that in the case of trainee community health workers lecturing alone is not enough to help them learn the necessary skills. This chapter considers the teaching and learning difficulties of trainers and trainee community health workers, respectively, and describes teaching methods suitable for training community health workers in nutrition.

> Lectures alone are not enough to help trainees learn the necessary skills.

Teaching difficulties of trainers

Trainers of community health workers in nutrition often have different educational backgrounds (medicine, nutritional science, nursing, midwifery, etc.). Although all trainers have the necessary knowledge about nutrition, they often do not have enough knowledge about teaching methods that can facilitate learning. This is so because they *have not been trained to be teachers*. Thus, a good doctor, a good nurse, or a good nutritionist is not necessarily a good trainer as well.

> Trainers of community health workers often have no formal training in teaching.

Therefore, it is recommended that, before starting to teach, all trainers should learn the basic principles of teaching, formulating a curriculum, and planning a lesson. They must also know the advantages and disadvantages of the commonly used teaching methods and aids.

Points to remember in planning a training course

Objectives of the course

The main aim of a nutrition training course for community health workers should be to train the students to carry out the tasks they will be responsible for upon completion of their training. The trainer should obtain the job description of the community health workers he is expected to train to know what tasks should be included in the training course. It is most important to know exactly what tasks the trainees must learn. If the trainer is unsure about these tasks, it is very likely that the course will become excessively theoretical, dealing with the principles and science of nutrition rather than their application.

How much theory should be taught?

To be able to understand the reasons for carrying out particular tasks, the trainees must be taught some basic scientific facts about nutrition and human biology. The trainer must decide how much theoretical knowledge community health workers require in order to do the tasks well. In this regard the following points should be considered:

(*a*) Some trainers want to teach everything. This is not only impossible, but also not necessary.

(*b*) A good trainer should consider the subtasks associated with each task separately. He should then list these topics under two categories: "*must learn*" and "*useful to learn*". The first should include all the information all trainees must learn. After each lesson the trainer should ensure that the essential information has been learnt by *each* trainee. The second category should include information that may be useful to the trainees but is not essential for the performance of the tasks. The trainer should not spend much time on these

topics. He should only guide the trainees as to where they can find that information. Often too much time is wasted on details that are of little importance to the objectives of the course. Sometimes the trainer may have difficulty in deciding what to teach and what to omit. In such situations the trainer should try to decide what the students would do poorly if this detail were left out. If the answer is "nothing", then that detail should be left out.

> The trainer must specify and define the learning objectives clearly.

Helping students to learn

The role of the trainer is help the students to learn. The learning process can be made easier with the help of different teaching methods and aids. Lecturing is just one way of helping the trainees to learn; there are other, better methods. For example, the trainees can be given a hand-out and then asked to participate in a discussion on the subject of the hand-out. Another way is by assigning a task that requires the students to do something or to observe a real-life situation. The following Chinese proverb may be useful to remember in this context:

> • **Hear** and you **forget**
> • **See** and you **remember**
> • **Do** and you **understand.**

In the usual classroom teaching, most trainers prefer to lecture because it is the easiest thing to do. Moreover, in most training schools facilities are lacking for teaching by other methods. If lecturing is the only feasible method of teaching, some simple techniques can be used to improve its effectiveness.

Some simple ways of improving lectures

Planning topics in the lecture

First make a list of the topics to be covered in the lecture. This list should be in the order in which the topics must be learnt. Then decide what information and facts are essential for teaching each of the topics. Such planning facilitates the learning process.

> Unplanned lectures confuse students.

Giving the lecture

There is no one ideal way of giving a lecture. The style of lecturing depends on the subject of the lecture and the type and level of the trainees. With experience most trainers develop an effective way of lecturing. The following are some useful suggestions:

(*a*) *Find out how much the students already know.* What the trainees already know determines what they can learn next. An example will illustrate this point. If the trainer is going to lecture on the nutritional care of young children, the trainees should have already learnt about the nutritional values of commonly available foods in the community. Similarly, the trainees must know about monitoring the nutritional status of young children with the help of a growth chart before they learn about the identification and management of protein–energy malnutrition. In training courses in which several trainers lecture one group of trainees, this practice is sometimes not followed. Often, lectures are fixed according to the convenience of the trainers.

> Before giving a lecture find out what the trainees already know.

(*b*) *Before starting the lecture summarize the main topics to be covered.* It is a good practice to tell the trainees at the beginning of the lecture what topics are going to be covered and what is their importance with regard to the tasks the trainees will be expected to perform in the community. If the blackboard is normally used, write the headings of all the topics in the lecture before starting the lecture. This will help to create interest in the subject among the students.

> Write the topics of the lecture on the blackboard before starting the lecture.

(*c*) *Make the lecture interesting.* Standing before a group of trainees and talking in a dull and monotonous voice is the surest way of making the lecture ineffective. Some ways of making lectures more interesting are: asking questions, telling some real-life experiences related to the topic, and posing problems and asking trainees to suggest ways of solving them.

(*d*) *Speak loudly enough.* Speak loudly so that those sitting at the back of the class can hear clearly. Experience has shown that

trainee community health workers are likely to remain quiet and not ask the trainer to speak louder even if they cannot hear clearly.

(*e*) *Face the trainees and speak clearly*. It is most important to face the students while giving a lecture. Many trainers spend a lot of time looking at their notes or facing the blackboard while lecturing. This is a bad practice. It results in students losing interest in the lecture. Lecturing to a class of students should be regarded as similar to talking to a small group of people. Look at each of your trainees from time to time while giving the lecture. This is called "making eye contact".

(*f*) *Use simple language*. Speak in as simple language as possible so that all the trainees understand everything you say. Often, persons training to become community health workers have a poor educational background and therefore may have difficulty in understanding difficult words. Moreover, they may be from different regions of the country and may speak different dialects or even different languages.

Three simple rules for making a lecture effective:
- Speak loudly and clearly
- Face the trainees
- Use simple language.

(*g*) *Use visual aids whenever possible*. During a lecture it is good to use visual aids, such as a blackboard, charts, slides, or photographs to explain certain ideas. When properly used, visual aids can create interest in the subject among the trainees and can break the monotony of the lecture. Many trainers use visual aids, but not always in the best way. Here are some simple rules:

- *Write clearly*. Trainers should remember that students have a tendency to copy everything that is written on the blackboard. Quite often trainers write only a few words or incomplete sentences on the blackboard and speak the rest of the sentence. This may result in the trainees writing down a jumble of words which they will not be able to understand later. Therefore, all writing on the blackboard should be clear and legible. The trainer should also make sure that trainees in all parts of the classroom can clearly see the blackboard.
- *Draw simple diagrams*. If a diagram or a rough illustration is necessary to explain something, make sure that the drawing is as simple as possible. It should be noted that while the trainer may find a diagram simple it may still be confusing to the trainees. Avoid using graphs, bar diagrams and similar illustrations because these may be difficult for the trainees to understand.

(*h*) *To conclude the lecture summarize the main points again*. Some time should be kept at the end of the lecture for summarizing the main points which the trainer wants the trainees to remember. This will also provide an opportunity for the trainer to find out how much the trainees have learnt.

Teaching of skills

Community health workers have to acquire certain skills to perform the tasks required to provide health care to the community. In nutritional care, for example, community health workers have to perform tasks such as weighing children to monitor their growth, identifying children who are at risk of becoming malnourished, and advising mothers on how to feed young children. To do any one task well, the community health worker must first understand why that is necessary; for this she will need to have knowledge. Then, she must learn the skills needed to carry out that task.

Community health workers need to learn three types of skill to do their job well. First, they must have reasonable manual dexterity. For example, they would need to use their hands skillfully in weighing children and recording the weights on growth charts. Such skills are called *manual skills*. Second, they would need *thinking skills*, for such tasks as identifying children at risk of becoming malnourished, for example. Finally, they would need the ability to convince mothers and other people to change some of their habits and practices. For this they would need *communication skills*. (For example, community health workers would have to convince parents to get their children immunized.)

Skills cannot be learned through lectures and demonstrations alone. They have to be practised. Community health workers will need a lot of practice in doing tasks before they develop the necessary confidence to do those tasks independently.

Teaching of skills is best done in three steps. First, describe the task and the skills required to do it. Then demonstrate the skills. Finally, allow the trainees to practise the skills. The first two steps should be done at the same time

so that the trainees understand the link between them. Once the trainees have understood why a task is necessary and how to do it, they should start practising it quickly, while it is still fresh in their minds.

> Three steps in teaching particular skills:
> - Describe the task and skills required to do it
> - Demonstrate the skills
> - Allow the trainees to practise them.

Description of skills

First, the trainer should describe the task and the skills required to do it. He should also explain why the task is necessary, under what circumstances it is required, and what might go wrong if the skills are not learned properly.

For example, to do the task of monitoring growth by using a growth chart, a community health worker will need to learn various skills, including:

- Convincing mothers to bring their babies for weighing
- Checking the accuracy of weighing-scales
- Weighing babies correctly
- Recording their weights on growth charts
- Interpreting growth curves
- Giving appropriate advice to mothers.

In a lecture, the trainer should first describe the above task and skills using visual aids (such as pictures of a weighing-scale and a growth chart). While describing each of the above skills the trainer should point out what might go wrong and what would be the result of a mistake; for example, that if the weighing-scale is not checked properly before use all results would be wrong.

> Several skills may be needed to do one task.
> All skills should be learned and practised separately.

Demonstration of skills

After describing and explaining the task and associated skills, the trainer should demonstrate each skill separately. Sometimes, persons other than the trainer may do the demonstration. For example, doctors in a clinic or health centre may be asked to demonstrate how to identify nutritional deficiencies in a child.

Most of the skills can be demonstrated anywhere (classroom, health centre, etc.). Two simple rules should be followed during the demonstration:

(*a*) The demonstration should be clearly visible to all the trainees. When there is a large group of trainees, it is common to see a crowd around the demonstration, with quite a few trainees unable to see what is happening.

(*b*) Each step in the demonstration should be explained clearly. Also, the trainer should draw attention of the trainees to the common mistakes and omissions in each step. For example, if the trainer is demonstrating how to weigh a child, he should point out that it is easy to forget to make the zero adjustment before each weighing session. At the same time, the trainer should remind the trainees about the need for checking the scale with known weights from time to time. Both these points are important for accurate weighing.

Practising of skills

This is the most important part of the learning process. It is only by practising the tasks on their own that the trainees will develop the confidence necessary to do the tasks independently in the community. Unfortunately, enough attention is not always paid to this aspect of training because practice sessions are difficult to arrange and are time-consuming. What usually happens is that one or two visits are arranged to a health centre or community for the trainees to see how trained community health workers do the same tasks.

There are a number of different ways of helping trainees to practise skills, depending on the type of skill involved. One way is to assign projects to small groups of trainees. For example, two or three trainees may be asked to go to a community and identify children with malnutrition. Another way of practising the same task of identifying malnourished children is to let trainees examine malnourished children in a health centre. Role-playing, when properly organized, can also be a very effective method of practising communication skills (e.g., nutrition education).

The best method of helping trainees to practise skills is, however, to let them work for a short period under the supervision of a trained community health worker. This will give the trainees an opportunity to practise skills in a real-life situation.

In any training course for community health workers, a major portion of the training time

should be spent on the teaching of skills. One or two visits to a clinic or community are not sufficient for trainees to practice skills.

Assessing how much the students have learnt

It is important for all trainers to know how much the students have learnt. This is the only way to know if the students will be able to do their job well after completion of the training. The process of knowing what the students have learnt is known as *assessment*. Most commonly assessment is done by means of an examination, in which there are usually three components—theoretical, practical, and oral. Assessment also enables the trainers to know how they themselves have performed as teachers. From the results of the assessment, trainers can find out which part of the training programme is strong or weak or how the training should be modified to get better results.

Final versus *continuous assessment*

In most training courses, the students are assessed at the end of the course on the basis of a final examination. However, students can also be assessed periodically during the entire course. Generally, this form of *continuous assessment* has many advantages over *final assessment*. Some of the advantages are:

- Continuous assessment is a more reliable indicator of what the students have learnt during the course
- The tension and worries of a final examination are avoided and the students are motivated to work hard throughout the course, instead of leaving everything to the end before the final examination
- Continuous assessment enables the trainers to keep a continuous check on their own performance and on the usefulness of the course, and, if necessary, the trainers can modify the course.

Methods of assessment

There are many methods of assessment, but none of them is perfect. Each has some advantages and some drawbacks. The trainer must choose one or a combination of methods to assess the trainees. The choice of the method (or methods) will depend on what exactly the trainer wants to assess. The trainer will also have to fix a minimum acceptable level of performance for the trainees. A brief description of methods of assessment is given below.

(*a*) *Informal testing* can be done inside the class or outside.

In class, you may put questions to the class as a whole. You can assess the difficulties of the class, or of individuals, with the subject matter. Outside the class, the questions will usually be put to individual trainees or small groups of them. Some points to bear in mind are:

- The questions should be related to the objectives.
- The questions should be clear and precise.
- The questions should require fairly short answers.
- Give everyone an equal chance to answer questions.
- Encourage the students and do not ask any question in a way that might embarrass a student.

After class, *the trainer should check his/her own performance*:

- Were the learning objectives clearly specified and defined?
- Did all the trainees know what the objectives were and understand them?
- Were the content of the lesson and the teaching methods and aids right for the learning objectives?
- Were the teaching aids properly prepared for the lesson?
- Was there a proper check of how the trainees were progressing?
- Did the introduction to the lesson link it clearly with the previous lesson?
- Were the right examples used to clarify important points?
- Was there enough time for questions?
- Was the material presented clearly and could the trainer always be heard?
- Was there a good summary at the conclusion of the lesson?

(*b*) *Formal testing* or *examination* may be done in various ways

Practical tests. The trainee demonstrates her ability to perform certain practical tasks. These must be relevant to the learning objectives. There should be enough time to complete the test. The trainees should have been shown how to do the task and should have practised it before being tested. As an example of a practical test, trainees may be asked to demonstrate how to weigh a child accurately and how to record the result on a growth chart.

Oral tests. The trainee's knowledge of a subject is probed deeply by verbal questions and answers. The ability of the trainee to give satisfactory answers may be affected by her communication skills, her self-confidence, and the encouragement given by the trainer or the person conducting the testing. If a grade is given, it may be affected by the personal feelings of the tester.

Written tests. The trainee's knowledge is tested by writing answers to questions. When writing test questions, always think how relevant they are to the learning objectives and to the trainees. There are two types of written tests:

(*i*) Written tests with long answers or essays. These are often used in academic situations and may not be advisable for community health workers. They are useful for judging the depth of knowledge of trainees and how they express themselves. It is often difficult to grade the results with fairness.

(*ii*) Written tests with short answers. These may require one-word answers, completing a sentence, stating whether a given answer is true or false, or choosing the correct answers among several that are given. For each question, there is a precise answer. It takes time to prepare the questions, but the correction and marking of the tests is very easy and quick.

Useful hints about teaching aids

Selecting teaching aids

The proper use of teaching aids requires much careful thought. This is particularly true if they have to be prepared from scratch. The trainer should always make quite sure that the subject matter, the training methods and the visual aids are all suited to each other. The trainer should also have adequate rehearsal in their use, especially if they are being used for the first time, to ensure that she is quite familiar with them. Some factors to consider in choosing the aids are:

- *Situation.* To whom will the presentation be made—one trainee or a group of trainees? Where will the presentation take place—clinic, classroom or field? This will affect the size of the aid. How often will the aids be used? If they are to be used once only, it may not be worth while to prepare expensive and elaborate aids. Will the use of the aids depend on such things as electricity, transport or other equipment like projectors; if so, are these available?
- *Subject matter and desired effect.* What emotion is the trainer trying to arouse—fear, surprise, shock? A much stronger impact can be made when teaching the symptoms and effects of kwashiorkor or marasmus by showing real severe cases or coloured pictures than by using sketches. Does the information require gradual building-up and linking with other information?
- *Cost.* Teaching aids cost money, and some are very expensive. Film and slide projectors and overhead projectors are the most expensive, followed by the magnetic board and the flannel-board. *Blackboards are cheap and are practical in many situations.*

A number of common teaching aids, their advantages and disadvantages and some useful tips on their preparation and use are listed in Table 1.

Table 1. Some common teaching aids

Teaching aid	Advantages	Disadvantages	Tips on preparation and use
Handouts and other printed matter	Particularly useful to trainees because they serve as visual aids during the training. Can also serve as useful sources of reference later on.	May distract trainees who will read or work on handouts if they are distributed too early. Not very useful for illiterate trainees unless carefully planned. Reproduction depends on available facilities and time, e.g., stencil, offset, typing with carbon copies, photocopying machine.	Can be designed in different ways: • as visual illustration of trainer's presentation • as work-books with exercises • simply as printed information. State the use of the handouts. Plan carefully the spacing, illustrations, labelling, headings, paging, type and size of paper.

Table 1. (*continued*)

Teaching aid	Advantages	Disadvantages	Tips on preparation and use
Blackboard	Generally available and inexpensive. Does not require advance preparation of visual aids. Very useful in presentations which require much erasing, e.g., mathematical calculations. Allows step-by-step build-up of presentation.	Trainer has to turn her back to the trainees. When writing, her attention is on the board, not on the trainees. Trainer does not see audience reaction while writing. Can usually be read or seen only at a limited distance. Dusty and messy to hands and clothing. Limited dramatic effect of the presentation.	Keep in mind the audience for whom you are writing. Use print or block capitals for emphasis. Write only the essentials; do not overcrowd; be tidy and neat. Use coloured chalk for emphasis. Carry your own chalk and eraser to ensure availability.
Charts and posters	Useful for displaying information on a permanent or temporary basis. May be prepared cheaply by the trainer, especially if only one or a few copies are needed. May be produced in quantity by a printer. Flip-charts are useful for presenting a number of points (or even story-telling) in short steps and certain order. Presentation is not messy and saves time. Materials are reusable for summary review and another presentation. Portable.	Pages have limited spaces. Could present problems in transportation and storage, depending on number and bulk. Limited dramatic effect of the presentation. Should be big to be useful with a large group of trainees.	Do not overcrowd; use big, clear lettering. If cost permits, use colour. Uncover the charts or posters one by one to create suspense and concentrate attention. Avoid crinkled and noisy sheets, which can be annoying. Stand to one side when presenting the chart. Store carefully and preserve well for next use.
Flip-charts	Inexpensive and allow for writing space where blackboard is not available. Easy to carry. Useful for recording ideas during group discussions.	Require a special felt-tipped pen for big writing. Suitable only for small groups.	Bring extra paper and pens of different colours; also tape or thumb-tacks for fixing paper on the wall.
Flannel-board	Easy and inexpensive to construct. Can be prepared in advance. Reusable and permits quick changes. Permits step-by-step build-up of complex figures. Versatile: can use words, phrases, lines, drawings, photographs and other cut-outs.	Visual aids have to be prepared in advance.	The essential parts of any flannel-board are the flannel itself, from which the surface and the cut-outs to be placed on it are made, and a flat piece of wood to keep the flannel firm. The backs of the cut-outs are pasted with material to make them stick on the flannel. This may be sandpaper, blotting paper, foam-rubber or any other material that will adhere to the flannel. Plan and rehearse in advance the exact appearance of the board at any one time during presentation. Mark the positions of cut-outs lightly. Arrange the cut-outs in the order of presentation before you begin. Store the board and cut-outs carefully to keep them clean and prevent the sides folding.

Table 1. (*continued*)

Teaching aid	Advantages	Disadvantages	Tips on preparation and use
Overhead projector	Flexible materials can be prepared easily by different methods. It can be used in different ways—for writing and presentation of charts, etc. Can be used without completely darkening the room. It is easy to manipulate. Trainer faces audience all the time. She can work and write on it (horizontal surface) while sitting down. Permits use of colour and other effects by presenting short steps in orderly sequence. Transparencies are reusable.	The projector is expensive. Requires electricity, special pen and acetate or plastic transparencies. Heavy, although portable. Spare parts may be difficult to obtain and expensive. Light from the projector in the trainer's eyes may be unpleasant.	Produce transparencies by drawing or writing directly on to transparent acetate (plastic) sheets. Use suitable grease pencils or felt-tipped pens. Two techniques which may be used are: • "overlay" technique: transparencies can be laid one on top of the other to add labels, colour, or other details. • "uncover" technique: start by covering the entire transparency with a sheet of paper and gradually uncover more parts as necessary. Mount transparencies on cardboard with adhesive tape to preserve them for future use and for easier handling. Store carefully. Arrange transparencies in exact order of presentation; rehearse their use.
Slides and filmstrips with appropriate projector	Easiest way of bringing real-life situations into the classroom; colourful and dramatic. Less expensive and easier to operate than films. They may be prepared for a complete lesson, accompanied by written notes or tape-recorded commentary. Filmstrips cannot get out of order. Both slides and filmstrips are compact and convenient.	Expensive. Most projectors require electricity. Even the portable models may present a problem in mobility. Spare parts may be difficult to obtain and expensive. Require darkened room for presentation.	Slides are easier to edit and arrange for training purposes than filmstrips. Put slides in the right order before presentation. If filmstrip is used, check the direction of the filmstrip. In both cases, make sure you have the correct machine. Rehearse. Before and after the showing, prepare good presentation guides, e.g., what to look for, discussion guidelines or leading questions. Repeat the showing or parts of it for emphasis. Switch off projector when not in use. Make sure you have extra bulbs and long extension cord.
Sound filmstrips or slide-tape, presentations	The accompanying tape can present a dramatic account of the story behind the slides or filmstrip. This can be very dramatic, and effective for motivation and training, especially if professionally done.	Additional investment needed for equipment. Need special expertise to prepare and training and practise to use.	The script or story (sound) and pictures should match well. Many agencies have prepared good sound filmstrips on slide-tape presentations. It would be less expensive to purchase these than prepare from scratch. Always preview before buying to see if relevant to your need and situation.
Use of real examples (e.g., real food items or food models)	Convenient and bring real-life situations to class. Very effective for clear teaching and learning.	May not be readily available or difficult to bring in.	Use real examples whenever possible.

Table 1. (*continued*)

Teaching aid	Advantages	Disadvantages	Tips on preparation and use
Radio	Radio is probably the most widely available mass communication medium. It is very popular in rural areas. It is cheap, easy to operate, and portable. It meets the need of institutions to reach scattered and distant segments of the population. Broadcasts can be taped for replay.	Available broadcasts may not contain material that is useful to the trainer. Influence on station programming is possible only through official channels. This requires considerable preparation. Listener reaction to the programme is not known, except when the broadcast is being heard by trainer and trainees in a group. Limited to audio only.	If broadcast of a certain programme is known in advance, group listening can be organized. About 20 members listen together and discuss what they heard, using guide questions. Feedbacks can be given to the broadcasting station. To be successful, the radio programme must be phrased to be understandable to the community. It must be presented to interest the average listener.

Designing visual aids

Visual aids are intended to improve the transfer of knowledge and skills by showing what has to be learnt or done. They must be very carefully chosen to suit the subject. If new ones have to be designed, the following points should be borne in mind:

- Use pictures whenever possible.
- When words and numerals must also be used, use as few as possible.
- Use graphs to present statistics and numerical information such as the results of weight surveys.
- Use colours as often as possible. *The use of colours can increase the effectiveness of a picture and emphasize key points.* They can be used for coding, contrast, and improving visibility. Colour combinations or contrasts are important. The colours that attract attention best are red and blue.
- Make the visual display simple and easy to understand. Use only key words and phrases, simple shapes and lines, and a few well-chosen colours. *Do not crowd the display.*
- For lettering, use special pens of the desired size, colour and boldness. You may use commercial pre-cut letters, lettering guides (stencils) and stick-on letters, or you may write free-hand. Be sure the letters are large enough and not overcrowded so that those at the back can read them.
- If a complex figure is necessary, the different elements should be introduced one by one. If you build up the picture step by step it will be more easily understood and accepted. Flannel-boards and overhead projectors are very good for this purpose; for instance, a flannel-board can be used to teach the use of a growth chart.

Teaching methods

There are many methods of teaching. Five of them are summarized in Table 2. Each one has to be studied to determine its suitability for certain tasks.

The main factors to be considered in choosing teaching methods are:

- The trainer's knowledge and experience in teaching, familiarity with the methods, and ability to communicate.
- The trainees' intellectual level, educational background, age and practical experience, and social and cultural environment.
- The objectives of the training. The changes to be brought about through training are defined in terms of knowledge, attitudes, and skills. Depending on the objectives, one method or a combination of methods may be used. For instance, if trainees are to acquire skills in identifying problems and in decision-making, it is better to give a brief talk, and have them work on a case-study or to practise role-playing than to give them lectures. Role-playing is also useful to improve communication skills and behaviour.
- The subject matter. Different subjects lend themselves to different teaching methods.

The self-confidence that trainees need in order to teach mothers can be built up by role-playing. Comparing the cost of breast-feeding and bottle-feeding can best be done in an actual exercise.

- Time and other resources. The costs involved, the amount of time available, the time of the day when training is given, and the availability of facilities and equipment are important.

Table 2. Common teaching methods

Method	Description	Advantages/Uses	Disadvantages/Limitations	Example or Application
Lecture	Trainer does most of the talking, with very little participation from the trainees. May be supported by the use of teaching aids.	Suitable for large audiences. Trainer can plan the presentation exactly in advance. Trainer can present large amount of information in short time.	Provides only limited level of stimulation. May be difficult for trainees to take complete and accurate notes. Very limited participation by trainees. Difficult to distinguish between difference in learning style and background among trainees.	If lecture has to be used, try to limit it to not more than 20 minutes of talk. Lecturer may ask questions during the talk to check trainees' understanding and to keep their attention. Allow time for questions and answers afterwards.
Group discussion	Free exchange of knowledge, ideas and opinions among trainees and trainer. Less formal than lectures and trainees usually do more talking than the trainer. Can be used to examine issues in depth, explore alternative opinions and develop communication skills.	Active role of trainees enhances improvement of attitudes. Suitable for changing attitudes and forming and applying opinions. Good for finding out what knowledge trainees have learned.	Time-consuming. Unequal participation by trainees unless properly guided. May deviate from the subject matter.	
Role-playing	Trainees enact the role of a certain person in a particular situation. The whole situation is described and played as realistically as possible. Used to practise real-life situations.	Suitable for near-to-life-practise situations. This practise can give confidence to trainees when faced with the real situation. Trainees may become highly involved. Trainees immediately find out how effective their performance has been. Trainees can work independently once they know the rules and their roles. Useful in strengthening the skills of human interaction, and in strengthening the skills of planning, decision-making, and thinking.	Criticism after the role-playing can embarrass trainees unless properly guided. Roles may not be played seriously. Requires plenty of time. Preparation requires special skill and experience, and time.	Usually a trainee plays the role of a community health worker and what she will do in a given situation, e.g., what advice she will give to a pregnant mother of a less than 6-month-old baby.

Table 2. (*continued*)

Method	Description	Advantages/Uses	Disadvantages/Limitations	Example or Application
Real-world experience	To develop certain attitudes and practise skills, trainees are made to experience the real situation.	Realistic attitudes and skills are developed.	Available opportunities are limited. Making the necessary arrangements takes time.	Experience should be well prepared, structured and followed up. An *example* is to have trainees live in the community for a certain period to increase their awareness of the conditions in the community.
Case-study	A short description of a situation in which a community health worker has to teach something to the community is presented. A problem related to teaching this subject is also given. Questions are given to direct the trainees to come up with possible solutions. They discuss their proposed solutions.	Trainees participate actively. Useful in developing problem-solving skills. Trainees immediately know how well they are doing.	Takes time.	*Example*. One of the first tasks of a new community health worker in a rural community is to discuss the possibility of a nutrition programme with the community. There have been previous attempts to establish a similar programme before but these failed. People therefore do not believe that there is a need to do this again. What will she do to convince people? The trainees discuss the advantages and disadvantages of the strategies proposed.

Chapter 3

Some basic facts about food

All nutrition trainers have adequate knowledge about food. This chapter is included here only to provide the trainers with a summary of the basic facts about foods that all community health workers *must know*.

Most of the information in this chapter is also mentioned later in different modules. However, it is recommended that trainers teach the information in this chapter to the trainees in an introductory lesson, i.e., before teaching the modules. This will make it easier for the trainees to understand the tasks in the modules.

This chapter is presented in the form of questions and answers so that the trainees can also use it for self-instruction. It is suggested that the trainer ask the trainees to read this chapter before discussing it in class. At that time, the trainer can provide additional information, if necessary.

What is food?

Everything that we normally eat and drink can be called food. Things consumed as food differ from one country to another and sometimes even within different regions of one country. The things people regard as food in different parts of the world have been selected by trial and error over hundreds of years. The community health worker must know what types of food are consumed in her area, what items of food people like, and what foods people do not eat even though they are cheap and abundant; the community health worker should also know why people do not eat certain types of food.

Why do we eat?

We eat whenever we are hungry. Satisfying hunger is just one function of foods, however; there are other important functions that we usually do not think about when we eat. Basically, foods have three important functions for the human body: to provide energy, to sustain growth, to give protection from disease.

Functions of foods:
- To give energy for all types of activity
- To help the body to grow in size
- To protect the body from diseases.

Different foods have different functions

Foods contain chemical substances known as **nutrients.** These can be divided into three categories according to their function: energy-giving nutrients, body-building nutrients, and protective nutrients. Most foods contain a mixture of the three categories of nutrients, but usually in one type of food one of the categories is present in a larger amount than the other two, and the function of that nutrient becomes the main function of that food. For example, cereals such as rice and wheat have all three categories of nutrients, but the energy-giving nutrients are the most abundant, and therefore giving energy is the main function of cereals. However, if a cereal is taken in large amounts, it can also supply sufficient nutrients for promoting growth. For example, in several South-East Asian countries rice not only supplies energy, but a major part of the body's need for body-building nutrients.

Commonly eaten foods can be broadly divided into three groups according to these three functions. All community health workers should remember these food categories.

Energy-giving foods:	**Cereals** like rice, wheat, corn, or millets **Fats and oil** **Starchy vegetables** like potatoes, sweet potato, cassava **Sugar, molasses, and honey**

Growth-promoting foods:	**Most foods of animal origin**, e.g., milk, eggs, fish, and meat **Some foods of vegetable origin**, e.g., pulses, peas, beans, and nuts
Protective foods:	**Vegetables**, especially the green leafy type **Yellow- and orange-coloured fruits and vegetables** like carrots, papaya, mango, tomato, orange **Fruits with sour juice** like orange, lime, lemon, grapefruit

What should we eat?

There is no such thing as an ideal diet. But to live a healthy life we must eat a mixture of foods, some that give energy, some that promote growth, and some that protect from disease. (In the case of adults, growth-promoting foods are needed for the repair of the daily wear and tear of the body.) Thus, we should not be guided only by our taste. The quantity of each type of food and combinations can of course vary.

Quite often children are fond of eating sweets and reject other foods which are good for them. This is harmful for the body and teeth.

Is there any dietary pattern in developing countries?

Yes, there is a dietary pattern, especially in the case of adults. Men and women living in different countries and in different environments remain healthy on diets that differ widely. Delicious foods in one country are not even regarded as food in others. In spite of these differences, there is a common pattern among adult diets in developing countries even though owing to poverty the choice of foods is limited. The pattern is as follows:

- The *main part* of the diet consists of *cereals* such as rice, wheat, corn, or millet or foods prepared from these cereals. Cereals are normally the cheapest part of the diet. In some parts of the world plantain, cassava, or potatoes form the main part of the diet instead of cereals.
- *Supplementary foods* include *pulses*, *beans*, and *peas*. These are always eaten with the cereals. They give variety to the diet and make the cereals more palatable. Similarly, *vegetables* are also eaten with cereals and pulses to increase palatability and variety.

Thus, in most developing countries the majority of the people live largely on diets made up of cereals, beans or pulses, and some vegetables. However, some other types of food are also consumed in lesser quantities. These are foods of animal origin. They are the most expensive items of the diet, and include meat, fish, and milk and milk products. Fats and oils, which are mostly used for cooking foods, greatly improve the taste of food.

Since foods of animal origin are generally expensive, only rich people can afford to eat them regularly. Animal fats are more expensive than vegetable oils. With improvement in economic status, the quantity of fats and oils in the diet increases.

A daily diet should be a mixture of:
- Cereals
- Pulses, beans or peas
- Vegetables, preferably of the green leafy type. Animal foods are a welcome addition.

Are animal foods essential?

No, but they are desirable. As mentioned earlier, animal foods are very useful for promoting growth in children. In adults, growth-promoting foods are needed for the repair of the daily wear and tear of the body. In fact, even when the body is still growing, some wear and tear does take place and growth-promoting foods are needed for repair. **Protein** is the nutrient specially suitable for this function. The protein found in all animal foods is of high quality, and it is present in large amounts.

However, vegetable foods like peas, beans, pulses, and nuts also contain large amounts of protein, and therefore can promote growth as well. But the protein in such vegetable foods is of a lower quality. However, when two or more protein-containing vegetable foods are mixed, the protein in the food mixture is almost of the same quality as that found in animal foods. The community health workers should know the types of food mixtures that give such superior combinations. The following are two good combinations:

- *Double mix*: Cereals plus pulses—e.g., rice and pulses, corn and beans, and wheat and pulses or beans or peas.

- *Triple mix*: Cereals plus pulses or beans, plus green leafy vegetables. In some societies plantain, potatoes, or cassava are used in place of cereals. These are as good as cereals for double and triple mix foods.

Mixtures of vegetable foods are almost as good as animal foods for growth promotion.

If animal foods are within the family budget and are normally consumed, then the addition of even a small quantity of animal food to a vegetable food mixture greatly improves the growth-promoting effect. This is specially important in the feeding of infants and young children.

Animal foods are not essential. They are desirable, especially for infants and young children.

Mothers' milk is an excellent addition to vegetable food mixture in promoting growth of infants and very young children. That is why the advice to all mothers should be to *continue breast-feeding as long as possible*, because even a small quantity of mother's milk can greatly improve the quality of vegetable food supplements the infant or the young child is getting. This is more important if the mother cannot afford to give other types of milk (e.g., cow's milk) to her infant or child.

When are growth-promoting foods most important?

Infants and young children grow very rapidly. A healthy new-born baby doubles his weight in 5 months. This growth is the result of increase in the amount of soft tissue (muscle, skin, etc.) and in the size of bones, which make up the frame of the body. Thus, children need foods that promote the growth of both soft tissues and bones.

Proteins are nutrients that promote the growth of soft tissues. **Minerals** (another type of nutrient) promote the growth of bones. Foods for young children should contain both these nutrients.

Milk is excellent for the growth of muscles and bones in infants and young children—breast milk is best.

The following is a list of some categories of foods that are excellent for the growth of infants and young children:

- Pulses such as lentils and grams (green gram and black gram)
- Peas and beans (e.g., soya beans)
- Nuts (e.g., peanuts)
- Vegetables (especially the green leafy type)
- Milk and milk products
- Other foods of animal origin (e.g., meat, fish, and eggs).

During pregnancy a woman's body grows very rapidly. This growth takes place not only inside the womb, but also in her own body. In the course of only 280 days of pregnancy, a tiny fertilized egg cell grows into a fully formed baby of 2500 grams or more. The raw material needed for this tremendous growth comes from the diet of the mother. If the mother lives on a poor diet during pregnancy, her baby will be lighter and smaller (low-birth-weight infant). Such babies can be regarded as malnourished. They are vulnerable to not only nutritional deficiencies but also infectious diseases.

Dietary care in pregnancy is the starting point for good infant nutrition.

Breast-feeding mothers also need extra growth-promoting foods. Human milk is produced in the breasts of the mother from raw materials which come from her diet. In order to produce enough milk of good quality, a mother must have a diet consisting of adequate amounts of cereals, pulses, beans, vegetables, oils, and, if possible, animal foods.

Why should we pay special attention to the feeding of infants and young children?

It was mentioned above that infants and young children grow very rapidly. There is growth of soft tissues and also of the bones, for both of which special care has to be taken to include growth-promoting foods in the daily diet. However, it is important to pay special attention to the feeding of infants and young children for other reasons:

(*a*) Although infants and young children are small and appear to be inactive, they are in fact very active. Their need for energy in relation to their body size is much greater than

that of an adult. This fact is usually forgotten. *Special care is necessary to include in the diet energy-giving foods like cereals, fats and oils, and sugar.* Giving growth-promoting foods alone is not enough.

(*b*) Infants and small children have no or few teeth. This means that they cannot eat solid or hard foods that require chewing. Therefore, only liquid or semi-solid foods should be selected for them. If solid foods have to be given, they should be prepared in such a way that they become soft. Some foods do not become soft even after much cooking (e.g., certain tough, fibrous vegetables); these should be avoided even though they are nutritious. Soft, cooked cereals and pulses, boiled mashed potatoes, and cooked, mashed, and sieved vegetables are very suitable preparations to start with. Do not forget to add a little oil or fat in the preparation.

(*c*) Infants and young children have small stomachs and therefore they can eat only a small quantity of food at each feed. Adults on the other hand eat only two or three big meals a day. *In the feeding of young children, the golden rule is to give small and frequent feeds.*

Remember:
- Infants and young children are very active and need a lot of energy
- They cannot chew properly
- They can eat only a small quantity of food at each feed.

Therefore, give them:
- Both growth-promoting and energy-rich foods
- Foods of soft, semi-solid consistency
- Small but frequent feeds.

Training modules

MODULE 1

GETTING TO KNOW THE COMMUNITY AND ITS NEEDS

LEARNING OBJECTIVES

After studying this chapter, taking part in discussions, and doing the exercises, a community health worker should be able to:

- Collect information that will help to show what are the nutritional and nutrition-related problems and needs of the community.
- Decide which social groups, families, and individuals are at special risk of nutritional problems. These people are sometimes referred to as the "target population". Help should be given to this group in particular.
- Identify the nutrition problems, and, with the help of the supervisor, plan the actions or tasks to deal with these problems.
- Identify people and the organizations in the community that can help with the nutrition problems and prepare a list of what they can do, how they can help, and how to build an understanding with them. People who can help in various ways are sometimes called "resource persons".
- Decide which people are seriously ill and should be referred to the nearest health centre or medical supervisor.

TRAINING CONTENT

Why should we know the community?

In order to help a community we must know what are its "*actual*" needs and what are its "*felt*" needs with respect to nutrition. The things a community wants, or thinks it needs (its "felt needs"), may not always be the same as the "actual needs"—the things that are really necessary. If we do not know the hopes and desires of a community it may be difficult to help the people. The "felt" needs and the "actual" nutritional needs should both be satisfied if a programme to improve nutrition is to succeed.

Services which are intended to help people will be most effective when the people themselves help in their planning and implementation. ***But first the people must realize that there are solutions to their problems.*** They must also have confidence in their own capabilities. If they feel that a programme is being forced on them, they may oppose it and it will fail.

If you live in a community you may think you already know all about it. But to help a community to help itself, it is necessary to study it in detail. It is essential to know most of the people, and not simply the ones who live near you or the ones who appear to be important. It is essential to know their problems and what causes them. It is essential to know what people and what organizations can help in different ways. This requires a systematic study and the desire to understand and help people. The sections below consider the different things the community health worker needs to learn about a community.

Information that will help to find out the nutritional needs of the community

Good nutrition and good health go together. Malnutrition is a sign of poor health. Young

children grow rapidly; therefore, their nutritional needs are great. A child who does not get enough food or the right mixture of food stops growing or grows slowly. *Growth failure is the first and most important sign of malnutrition.* The growth of children is an important indicator of the whole community's nutritional status; it is considered in detail in Module 2.

One can learn about the nutritional problems of a community by finding out which children fail to grow properly and why. This can be done by carrying out a nutrition survey of all the children in the community. Every child who is below the age of 5 years is weighed and, if possible, his height is also measured, and this information is related to the child's age. This procedure will be further described in Module 2.

Grading of malnutrition

With the above information it is possible to divide all children below the age of 5 years into three categories:

- Well nourished
- Moderately malnourished
- Severely malnourished.

Additional information about each child

In order to understand why there is growth failure, it is important to collect some additional information about each child.

- Sex (male or female)
- Family's community group (religion, class, caste, etc.)
- Size of the family. How many children have been born in the family? Are child-spacing devices used?
- Health status of the family. Have any children in the family died? Is anyone in the family ill?
- Occupation of parents. What work does each one do?
- Child's food. What milk (breast milk or other) does the child drink? What foods and how many times a day does the child eat?
- Child's health. Has the child had any illness? Is he well now?
- Immunizations. Has the child been immunized? If yes, against what disease or diseases and at what age?

On the basis of this information it will be possible to see which major factors are associated with growth failure and malnutrition in the children in the community.

Information about the community

In addition to the information on children and their families, there are other factors that relate to the nutritional status of the community. The community health worker can investigate these factors by finding answers to the questions listed below:

- How poor or how rich are the majority of the families in the community?
- Who owns the land in the community? (This applies particularly to rural communities).
- What are the patterns of work of the people?
- Is clean water readily available for drinking and washing?
- What are the community's beliefs and practices about food in disease and in health?
- What is the influence of seasonal changes on the availability of clean water and food, and on the health and economic status of the community?

This information can be obtained by careful observation, informal discussions with community members, and planned interviews. A detailed discussion of how each of these factors affect nutrition follows.

Economic status and education

The economic status of a family (whether it is rich or poor) is perhaps the most important factor affecting nutrition. It relates to things such as the ability to buy food or land or animals which produce food. One can tell the economic status of people by looking at their houses, furniture, clothes, etc. Such observation is important because people often do not like to discuss their financial matters. Education is another important factor affecting nutrition. The level of education of an individual can often be judged by talking to him. Education also depends on the family's economic status. Children in poor families start working instead of going to school.

Land tenure

In rural communities, the majority of the population are often farmers. The question of *who owns the land* becomes important in considering the nutritional problems. Often the landowners do not live in the community. Most farmers in such communities are landless labourers who have no say in what crops

should be grown. The landowners may prefer cash crops (sugar-cane, tobacco, coffee, etc.) to food crops (wheat, rice, maize, etc.) because they bring in more money. This considerably reduces the amount of food that could be available in the community. Landless farmers are mostly paid low wages in cash, often insufficient to buy food from the open market.

In communities where the people own much of the land themselves, the following questions need to be considered in judging the community's nutritional status. *Is the land that the family owns extensive enough to supply the family's food needs*? Is the land irrigated? In many countries, most farmers do not own enough land to produce sufficient food to meet a family's need for a whole year. They have also to sell some of their produce to get cash money for other needs.

Working women

In communities where women also work, the following questions need to be asked. Can women take their very young children with them to work so that they can breast-feed them during the day? If the children have to stay at home, who looks after them? At what times of day or periods of the year do the mothers have more time or less time to look after their children?

Food availability

Seasonal fluctuations in the availability of work, food, and water are common in some communities. Often different seasons are associated with epidemics of diseases such as diarrhoea, malaria, and measles. Landless labourers suffer most nutritional problems during the non-farming season when they have no work.

Information about the kind and amount of food available in a community is essential in considering nutritional problems. In many village communities small farmers and farm labourers have staple food grains which last only 4–5 months after harvest. After this they eat tuber roots, cereal gruels, and purchased food. Some families are partly starved as a result of this. In some areas, too, foods such as fish, milk, beans, and fruit are seasonal. When cash crops are grown instead of food crops, not only is the food production reduced but money may also be diverted to alcoholic drinks and to nutritionally inferior processed foods and drinks that cause nutritional problems. In some countries, the consumption of imported brands of aerated soft drinks is causing nutritional problems. The community health worker should discourage the consumption of such drinks because they are always expensive and have little nutritional value. Money spent on such drinks could be used to buy more nutritious foods. Regular home visits and market visits during different seasons of the year give information about the availability and cost of foods. The "hungry season" is a regular occurrence in many communities.

Food distribution within the family

The dietary habits and methods of food preparation are important. How and how often is the food prepared and for how long is it stored? How many meals are eaten each day, and are the children given any snacks? Are any special foods prepared for children? Within the family who eats what, who is served first, are the children fed separately and from their own plates? These factors influence how much nourishment a young child receives.

Beliefs about foods

There are important beliefs associated with food in all communities. These traditions and habits have a strong influence on what food is eaten. Some foods are of high prestige, others of low prestige, and some are for special occasions. Some foods are considered to be "hot" or "cold" in many countries because they are believed to heat or cool the body. Certain foods are forbidden in some families (e.g., animal foods among vegetarians). At different ages and stages of life particular foods are considered to be harmful; for example, certain fruits are believed to induce abortions in pregnant women, and other foods are thought to influence the development of the child in the uterus. The community health worker must know what people in the community believe about different foods. Only then will she be able to advise them appropriately.

Resource persons

In all communities there will be people who are ready to help. Their influence should be put to good use. Some people have special skills in the fields of art, music, poetry, or drama that can be used to spread messages about good nutrition habits. Some people in the community may have fears about health and nutrition programmes, especially when surveys are done and inquiries made about people's way of life and property. Excessive use of alcohol can be a major problem in some

areas. The community health worker must know about all these matters and should be sensitive to people's feelings.

The methods commonly used in the collection of information are: review of available records, planned interviews using questionnaires, informal discussion, and observation.

How to decide who is at special risk of nutritional problems

Certain groups in the population are specially vulnerable to nutritional problems. These are children between the ages of 6 months and 3 years, and women who are pregnant or lactating. Families with pregnant mothers and young children can again be divided into groups at high and low risk by using information from the nutrition survey described earlier.

Children in developing countries in the following categories are known to be at risk of becoming malnourished.

(1) All infants who have not been breast-fed for at least the first 5–6 months of life.
(2) Infants with low birth-weights, below 2.5 kg.
(3) Twin or multiple births.
(4) Children high in the birth order, i.e., 5th, 6th, or subsequent children in large families.
(5) Children in a family in which an older brother or sister died in the first year after birth.
(6) Children with illnesses, particularly measles, whooping cough, or repeated diarrhoea, especially in the early months of life.
(7) Children of poor families.
(8) Orphans or children with only one parent or those with an indifferent step-father or step-mother.
(9) Children whose growth curve does not slope upwards, as explained in Module 2.
(10) Children who are cared for by older children because their mothers go out to work.
(11) Children with congenital defects, e.g., cleft-palate.

Certain groups of women are also at risk of malnutrition. This can affect not only their own health and capacity to work, but also that of their children. They are:

(1) Women who are wasted or grossly underweight at the beginning of a pregnancy.
(2) Women who gain too little weight (less than 6 kg) during the course of pregnancy.
(3) Women who have too short an interval (less then 6 months) between the end of one pregnancy and the beginning of the next pregnancy.
(4) Women who become pregnant before the age of 15 years.
(5) Women who have had more than five children.
(6) Women who have previously given birth to babies with a low birth-weight (less than 2.5 kg).

There may be special risk factors for women and children among different groups in the community. Hence, it is important to observe all social groups carefully.

Many nutrition programmes do not have enough resources: trained personnel or money. Therefore it is essential to concentrate the nutrition activities on those at greatest risk. It is known that concentrating in this way on a relatively small group of children and mothers can make a significant difference to the number of malnourished children and the number of deaths from malnutrition in a community.

How to identify nutritional problems and plan appropriate action

Once the information on nutrition in the community has been gathered, the community health worker and supervisor must analyse it. The main causes of malnutrition can be found by examining the social, economic, and health status of the high-risk groups. The problems of the community will be many and varied—from poverty to bad feeding habits—and so will the solutions to these problems. Health workers can do relatively little about poverty; probably the most they can do is to give their full support to community development programmes, and help poor families to use whatever they have more efficiently. But in the case of problems related to bad feeding practices, the community health worker can and should be able to do a lot.

> A community health worker cannot solve all problems of the community—she must select those problems that she can do something about.

Problems related to poor feeding practices should be listed in the order of their importance, and of how common they are in the community. This should be done in consultation with supervisors and others who have experience in treating and preventing malnutrition and who also know the community well. Each problem should be considered separately to see if a solution is possible. A list of *priority solutions* can then be made. Selection of priority solutions will depend on the answers to the following questions.

- How easily can the activities be undertaken by the community health worker and community? How manageable are these activities?
- Are the necessary resources readily available, or can they be easily mobilized?
- How important is the solution to the community? (Ask the opinion of the community leaders.)
- How important is the solution to the community health worker?
- How frequent (i.e., common or prevalent) is the problem to be solved?

For each selected solution the community health worker specifies the tasks she has to perform and the activities the community will participate in. She also identifies the resources she needs. Finally, the plan of action is completed by specifying the schedule of tasks and activities. *The community health worker should give priority to the problems that she can do something about, even if they do not seem very important by comparison with other problems in the community.* Overcoming poverty may be the biggest problem for instance, and giving nutrition advice to the community may appear much less important, but it is something practical that the community health worker can actually do. The priority list should be made up of tasks that are both important and feasible.

How to get to know and work with people and organizations that can help with nutritional problems

When finding out about the nutritional needs of the community the community health worker will meet many people who can help in solving nutritional problems. Such people will include *"formal" leaders*: the local religious heads, educated people like schoolteachers, postmasters, local doctors, landowners, heads of small industries, heads of women's or farmers' clubs, civil servants, and political leaders. It is also important to contact the *"informal" leaders*. These are people who do not hold any formal position in the community but are nevertheless influential and helpful. These people must be told about the importance of nutritional problems. They must understand how they can help, and their cooperation must be won. Their support will be essential in influencing the community.

The community health worker should seek the help of any government or private organizations working in the community. These will mostly include community development programmes and national nutrition supplementation programmes. The community health worker should have close contact with the schools in the community.

All community health workers will have a supervisor who may be a resident of the community or who may visit the community at regular intervals. The supervisor should be consulted about all the problems. In addition, if the community health worker is not herself a traditional birth attendant or traditional healer, she should seek the cooperation of such people. They know the people and have the confidence of the community, and they have much knowledge about common ailments and have provided health care for years.

There may also be programmes to increase the food production in the community, e.g., poultry and dairy farming development programmes, and those for improving fish ponds and home gardens. The community health worker should work closely with these. Other programmes that help indirectly include programmes for improved sanitation and water supply, and those for the control of infectious diseases and for family planning. She should also work closely with those working for an immunization programme, if there is one in the community.

Getting to know people is the first step towards working together with them. Some useful steps on how to know and work with the community are given below.

- Find out where the nearest health centre is so that difficult cases can be referred to it. Alternatively, such cases can be referred to the supervisor.
- With the assistance of the head of the community prepare a list (if one is not already available) of the organizations, formal and informal leaders, and personnel of both government and private organizations. Against each name write out their functions. It will also be useful to indicate

what resource (finance or special skill or knowledge) each of them represents.

- Find out when the highest community body (this may be community council or some other equivalent body) meets. With the help of the village head, arrange to attend one of their meetings. If the community health worker comes from outside the community, this gives her an opportunity to be formally introduced to its leaders. It also provides an opportunity for her to explain her purpose and role in the community, and to present the findings (i.e., problems and solutions) of her nutritional survey. In this way she can learn the reactions of the leaders and seek their support. On this important occasion, she may be accompanied by her supervisor.
- If there is no such meeting, the community health worker arranges for individual meetings with the community leaders and personnel of community development organizations for the same purpose. An alternative and faster step is to be introduced formally to the people by the village head through a community meeting or assembly.
- Arrange for periodic exchange of information between the community health worker and the community. This can be done through periodic meetings with community leaders, and personnel of community development organizations. Such meetings also provide an occasion for discussing the progress of the work of the community health worker, the problems encountered, and the results expected. It is important to make the community feel that the programme belongs to it.

Deciding which people are seriously ill and should be referred to the health services

Some patients, especially small children, may quickly become seriously ill and die. These "high-risk" patients should be referred at once to the medical supervisor or sent to the nearest health centre. Some danger signs of illness will be described in Modules 6, 7 and 8.

This is a list of some high-risk patients who should be referred immediately to the nearest health centre:

- Small newborn infants who weigh less than 2.5 kg
- Infants or young children who lose weight during 3 successive months in spite of regular advice to the parents on what to feed the child
- Children with acute diarrhoea who do not improve with the special fluid within 1–2 days, and those with signs and symptoms of dehydration
- Severely malnourished children with other complications like fever, cough, and rapid distressed breathing
- Very anaemic (pale) women who are very thin or who have swollen legs.

TRAINING METHODS

1. *Lecture*: Training content.
2. *Community survey*: Collection of information on the nutritional needs of the community.
3. *Group discussion*: Results of the community survey.

EXERCISES

Exercise 1. The food pathway—a problem analysis exercise

Ask all trainees to describe the pathway in the community between the production of food and its consumption by man (i.e., preparing ground for cultivation — planting — weeding — irrigating — harvesting — transporting — storing — selling — cooking — serving — eating — digesting).

This path will have many local variations. In some communities food transport and food shops may be unknown.

Next, ask trainees to describe the different problems that can occur in the food pathway. Discuss with the trainees how the problems can affect the nutrition and health status of a community and how they might be overcome.

Exercise 2. Information collection and analysis

In this exercise trainees can work in groups of 2–5. Each group plans a simple nutritional survey, stating and preparing the following:

—the purpose of the survey
—specific information to be collected
—how the information will be collected
—questionnaires or special forms to be used in the survey.

If possible, the groups should use different methods for collecting the information.

Ask each group to carry out the prepared survey plan and put together the collected information. Each group should then present its findings and an analysis of the collected information. Now discuss the problems encountered in collecting and interpreting the information. Suggest solutions that could have been undertaken. Ask the trainees to discuss what they consider to be the advantages and disadvantages of the different methods used in the surveys.

Exercise 3. Preparing a plan of action

In this exercise the trainees should work in pairs. From the information collected in Exercise 2 ask the trainees to select one nutritional problem in the community and write out answers to the following questions:

1. What is the problem? Why was it selected? What factors caused it?
2. Which group in the community is the target population? Give a brief account of its social and economic conditions.
3. How can the problem be solved?
   —What action has to be taken?
   —What will be the result of taking that action?
   —What resources are needed to take that action (what manpower, money, materials, space, time)?
   —What is the timetable for the different steps in the plan of action?
   —When and how is the progress of the action reviewed?

Each pair of trainees presents its plan of action. Discuss the advantages and disadvantages of each solution and how these could be improved.

MODULE 2

MEASURING AND MONITORING THE GROWTH AND NUTRITION OF CHILDREN

LEARNING OBJECTIVES

After studying this chapter, taking part in discussions, and doing the exercises, a community health worker should be able to:

- Explain the relationship between growth, development, and nutrition.
- Find out the age of a child by using a local-events calendar if the mother is not sure of the age of her child.
- Weigh a child accurately to within 100 grams.
- Record the weight of a child on a growth chart.
- Explain to the mother the features of the growth chart, and how it will help her decide whether or not the child is doing well.
- Interpret a child's growth pattern from the weight changes recorded.

TRAINING CONTENT

What is the relationship between nutrient intake, growth, and development?

Food is needed for growth, physical activities, and the maintenance of health.

Growth is the gradual increase in size of the body and its organs. ***Development*** is the increase in the number of skills performed by the body, including the brain, and in the performance of those skills. Growth and development are fundamental features of children. If a child is growing well he is probably healthy and adequately fed. If a child is not growing well, there must be some reason for this. He may have some illness or he may not be receiving adequate food. Months before a child has obvious signs of malnutrition he will have stopped growing. ***Measuring a child's growth is one way of measuring his nutritional condition and general health.***

Growth is measured in different ways. *Body weight* is the simplest measurement, and in children change in weight is the most reliable indicator of growth. When a baby is born he weighs about 3 kg. If he grows well he will weigh about 6 kg at 5 months of age and about 9 kg at 1 year of age. This means that healthy babies double their birth-weight in 5 months and treble their birth-weight in 12 months. After that the increase in weight is not so fast—only about 2 kg per year.

Height (or length of the body in the case of infants) is another measure of growth. At birth a baby is about 50 cm long. At 1 year of age he should be about 72 cm long. Height is a particularly useful indicator of growth among older children. If a child is quite tall, but his weight is low, he is thin or wasted. A malnourished child may also be short or stunted.

> By measuring weight and growth, we are measuring health.

A baby's head grows very quickly, especially in the first year of life. This is because the brain is growing very rapidly. Development, or

Table 3. Milestones of child development

Milestones	Age	
	Average baby	Nearly all babies
Able to sit without support	6½ months	9 months
Able to walk 10 steps without support	12 months	18 months
Able to say single words	15 months	21 months
Able to speak short phrases	23 months	36 months

the increase of skills, mainly depends on the brain and the nervous system. The growth and development of the brain requires adequate nutrition, just like other parts of the body. When a baby is born it can do very little for itself. Gradually he develops and is able to move his body in the way he wants and can do simple things. Special skills like talking develop later. It is useful to know the ages when most children can do some simple things. These are used as markers of development and are sometimes called "milestones of development" (see Table 3).

Factors other than nutrition can also influence development. Children only develop skills if they are given the opportunity. The presence of people who take an interest and talk to them, helps children to develop. Children left alone and given nothing to play with will develop slowly. There are only small differences in the rate of growth and development in different races. *Race does not have an important influence on growth and development compared with adequate nutrition and stimulation.*

In children normal growth and development are signs of good health and nutrition. One of the best ways to measure a child's health is to measure growth, and one of the easiest ways of measuring growth is to weigh a child regularly and to note how his body weight is increasing with age in comparison to the weights of healthy children of the same age.

How to find out the age of a child if the mother does not know—use of a local-events calendar

There are two important factors in measuring growth—weight and age. It is very important, therefore, to know the age of a child correctly. Often mothers do not remember the dates of birth of their children. In such cases the community health worker can estimate the age of a child by asking the mother certain questions and by using a local-events calendar.

The first and the simplest way of finding out the age of a child is to look up the local official register of births, baptismal certificate book, or similar record. Often mothers forget or are not aware of the existence of such records.

If the child is not registered or if no such records exist, the community health worker should first try to find out the year of birth of the child. This can be done by asking the mother if her child was born a few months before or after the birth of another child in the neighbourhood. The community health worker should then find out if the date of birth of that child is known. If the mother of the second child knows the date of birth of her child, the year of birth of the first child can be easily estimated. The year of birth can be easily determined in this way for children up to 4 years of age. In the case of older children the year of birth becomes difficult to estimate correctly; however, with older children it is not so important to be absolutely accurate.

The next step is to determine the month of birth. This can be done by the use of a ***local-events calendar***. A local-events calendar shows all the dates on which important events took place during a past 3–5 year period. It may show the different seasons, months, phases of the moon, local festivals and events in the agricultural cycle (Fig. 1). National and local occurrences of importance are also marked on it; these include storms and cyclones, political elections, the opening of nearby roads, cinemas, shops, etc. Each community health worker should make his own local-events calendar.

Using a local-events calendar, the community health worker tries to remind the mother of events that will help her to remember the birth of her child. She should start with the seasons—"Was it the hot, the wet, or the cold season when your baby was born?" She then asks her about the months, the festivals, and events in that part of the year, for example, "Was your baby born before or after such-and-such a festival?" Gradually she

Fig. 1. An example of part of a local-events calendar used in India*

Month	Important Events/Festivals	1979	1980	1981	1982	1983	1984
Margasira	New Year Day	1 Jan	1 Jan	1 Jan	1 Jan	1 Jan	1 Jan
(second half)	Full moon day	13 Jan	—	20 Jan	9 Jan	—	18 Jan
	New moon day	28 Jan	—	6 Jan	25 Jan	—	5 Jan
	Bhogi (Lohri)	13 Jan	14 Jan	13 Jan	13 Jan	13 Jan	13 Jan
	Sankranti	14 Jan	15 Jan	14 Jan	14 Jan	14 Jan	14 Jan
Pushyami	Pushyami begins on	29 Jan	1 Jan	—	1 Jan	—	12 Dec
	Republic Day	26 Jan	26 Jan	26 Jan	26 Jan	26 Jan	26 Jan
	Gandhi Vardhanti	30 Jan	30 Jan	30 Jan	30 Jan	30 Jan	30 Jan
	Full moon day	11 Feb	—	18 Feb	8 Feb	—	17 Feb
	New moon day	26 Feb	—	4 Feb	23 Feb	—	3 Feb
	Mahasivarathri	25 Feb	14 Feb	4 Mar	22 Feb	11 Feb	27 Feb
Magham	Magham begins on	27 Feb	14 Feb	—	25 Jan	29 Jan	2 Feb
	Full moon day	13 Mar	1 & 29 Mar	20 Mar	9 Mar	—	17 Mar
	New moon day	28 Mar	15 Mar	6 Mar	25 Mar	—	2 Mar
	Holi	14 Mar	1 Mar	20 Mar	10 Mar	29 Mar	17 Mar
Falgunam	Falgunam begins on	5 Apr	1 Mar	—	8 Mar	15 Mar	3 Mar
	Ugadi	28 Mar	17 Mar	5 Apr	26 Mar	14 Apr	2 Mar
	Lunar eclipse	13 Mar	—	20 Mar	9 Jan	—	—
	Sri Rama Navami	5 Apr	24 Mar	31 Mar	2 Apr	21 Apr	10 Apr
	Good Friday	13 Apr	4 Apr	17 Apr	9 Apr	1 Apr	20 Apr
	Mahavir Jayanti	—	29 Mar	17 Apr	—	25 Apr	14 Apr
	Full moon day	13 Apr	30 Apr	19 Apr	8 Apr	—	15 Apr
	New moon day	26 Apr	13 Apr	4 Apr	23 Apr	—	3 Apr
	Ambedkar Jayanti	14 Apr	14 Apr	14 Apr	14 Apr	14 Apr	14 Apr
	Tamil New Year Day	14 Apr	14 Apr	14 Apr	14 Apr	14 Apr	14 Apr
Chaitra	Chaitra begins on	27 Apr	—	—	26 Mar	14 Apr	2 Apr
	Full moon day	12 May	15 May	18 May	7 May	—	15 May
	New moon day	25 May	29 May	4 May	23 May	—	3 May
	May Day	1 May	1 May	1 May	1 May	1 May	1 May
	Budha Purnima	12 May	30 Apr	10 May	—	26 May	15 May
	Hanuman Jayanti	—	—	28 May	8 Apr	13 May	25 May
Vaisakha	Vaisakha begins on	27 May	—	—	1 May	13 May	3 May
	Full moon day	10 Jun	—	17 Jun	8 Jun	—	13 Jun
	New moon day	24 Jun	—	2 Jun	21 Jun	—	1 Jun
Jeshta	Jeshta begins on	25 Jun	—	—	1 Jun	11 Jan	3 May
	Full moon day	9 Jul	—	17 Jul	6 Jul	—	13 Jul
	New moon day	23 Jul	—	1 & 31 Jul	20 Jul	—	1 & 30 Jul
	Ramazan (Id-ul-Fitir)	26 Aug	—	—	23 Jul	12 Jul	1 Jul
	Jamat-ul-vida	—	—	31 Jul	—	8 Jul	28 Jun
Ashada	Ashada begins on	24 Jul	—	—	23 Jul	11 Jul	30 Jun
	Full moon day	8 Aug	—	15 Aug	4 Aug	23 Aug	11 Aug
	New moon day	22 Aug	—	29 Aug	19 Aug	—	28 Aug
	Independence Day	15 Aug	15 Aug	15 Aug	15 Aug	15 Aug	15 Aug
Sravana	Sravana begins on	23 Aug	—	—	—	19 Aug	29 Jul
	Krishna Janmashtami	15 Aug	1 Sep	22 Aug	12 Aug	31 Aug	20 Aug

* Compiled by Dr K. Vijayaraghavan, D. Hanumantha Rao, and M. Ratnam of the National Institute of Nutrition, Jamai-Osmania, Hyderabad, India.

narrows down the period until she can tell with some confidence in what month the child was born. This is possible for most small children, and it can be done quite quickly.

How to weigh a child accurately

A child's weight is a valuable measure of its health and nutrition. Weighing a child requires reliable equipment and a standard method to achieve accurate results.

There are two main types of weighing scale—*beam balance scales* and *spring scales*. A beam balance scale is usually accurate and reliable, but it is often heavy and expensive (Fig. 2). Scales of this kind are used in markets and shops in many countries and are therefore familiar. A spring scale on the other hand is quite cheap, fairly reliable, light, and easily

Fig. 2. Two types of beam balance

carried. Such a scale has one hook above, to hang the scale from a beam or a branch of a tree, and one hook below from which hangs a sling or basket (for infants) a small chair, or pair of pants (for older children) (Fig. 3). The child is placed in the sling or basket, seated on the chair, or slipped into the pants as the case may be. It is important that the child feels secure and the mother does not mind her child being suspended in that way.

The most common spring scale (often called a Salter scale, although many other brands exist) has a face or dial which looks like a clock. The weights are marked in kilograms around the dial. Some dials also show 100-gram divisions between kilograms, but the simplest scales only have kilograms marked by bold lines and 500 grams marked by thin lines. Such scales are convenient for workers with limited education because these lines are similar to those which are drawn on the most widely used growth charts (Fig. 4).

Accurate weighing is important.

Accurate weighing is important. A community health worker can learn how to weigh a child

Fig. 3. A spring balance

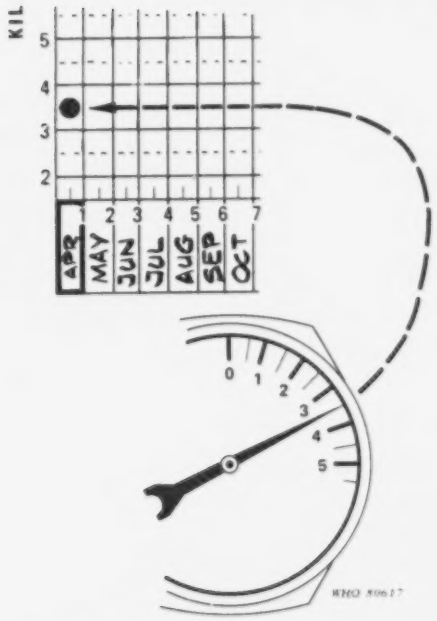


Fig. 4. The markings on the face of the spring scale should correspond to those on the growth chart. This helps the health workers in completing the chart, particularly if they are not familiar with the decimal system

quite easily by following the instructions given below:

1. Hang up the scale securely, keeping the dial at eye-level so that the weight can be read easily.
2. Adjust the pointer to zero before placing the child in the sling or basket. Most scales have a knob or screw to make this adjustment.
3. Undress the child with the help of the mother. It is better to weigh the child naked if it is not too cold and if local customs permit.
4. Place the child in the sling or basket with the help of the mother. Ask the mother to stand nearby and to talk to the child. The mother should not hold the child and the child's feet should not touch the ground when the weight is being read.
5. Read the weight on the scale. If the child is struggling try to calm him with the help of the mother and when he stops moving read the weight quickly.
6. Write down the weight in figures, for instance, 3.5 kg.

The growth chart

A growth chart is basically a graph on which a child's weight is shown at different ages. There are many types of growth chart in common use in different countries, but all of them have the same basic features. It is up to the health administration of each country to select or develop a chart suitable for the country. Figs. 5 and 6 show the two sides of a growth-chart developed by WHO. Figs. 7, 8, and 9 show examples of growth charts used in India, Indonesia, and Zaire, respectively

Across the prototype chart developed by WHO are printed two growth reference lines. The area between these lines gives the general direction of growth in healthy children. They are not the target of growth for all children. If a child's weight on the first weighing is much below the lower line, there is some reason for concern, and the community health worker should look for the reason. However, the direction of the child's own growth line, based on weighings at regular intervals, is of much more significance than any weight recorded below the lower reference line.

Not all growth charts have two reference lines. As can be seen from the Indian, Indonesian, and Zairian charts, there are additional lines. The purpose of these lines is to indicate the degree of malnutrition. i.e., how much the child is malnourished.

There are three degrees of malnutrition: mild, moderate, and severe. It is important to stress here that it is not important to know how much the child is undernourished by weighing him on the first visit. Rather, it is essential to note how he is growing (i.e., how his weight is increasing) on successive visits (weighings). In other words, the community health worker should be more concerned with the direction of the child's growth line rather than his actual weight. As long as a child's growth line continues to move upwards there is nothing to worry about, even if his weight remains in the area showing moderate malnutrition. On the other hand, if a child's weight is in the healthy path, but the direction of the line, based on successive weighings, is downwards, the community health worker should pay extra attention to that child. This point will be explained further in the section on how to interpret a growth chart.

All growth charts should be printed on card or paper sufficiently strong to be used for some years. The trainer should select the particular type of growth chart used in his country and should use it for training community health workers.

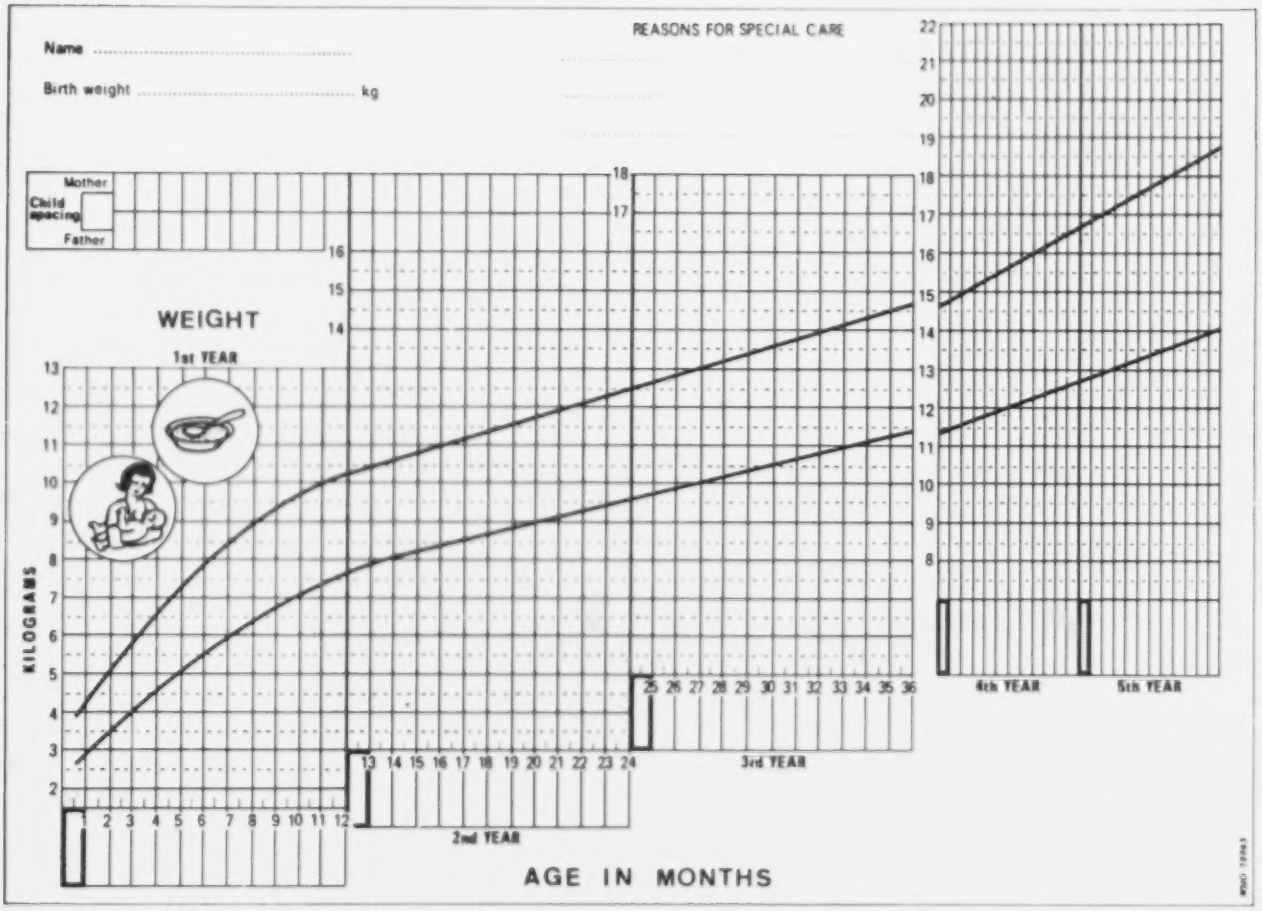


Fig. 5. A prototype growth chart developed by WHO

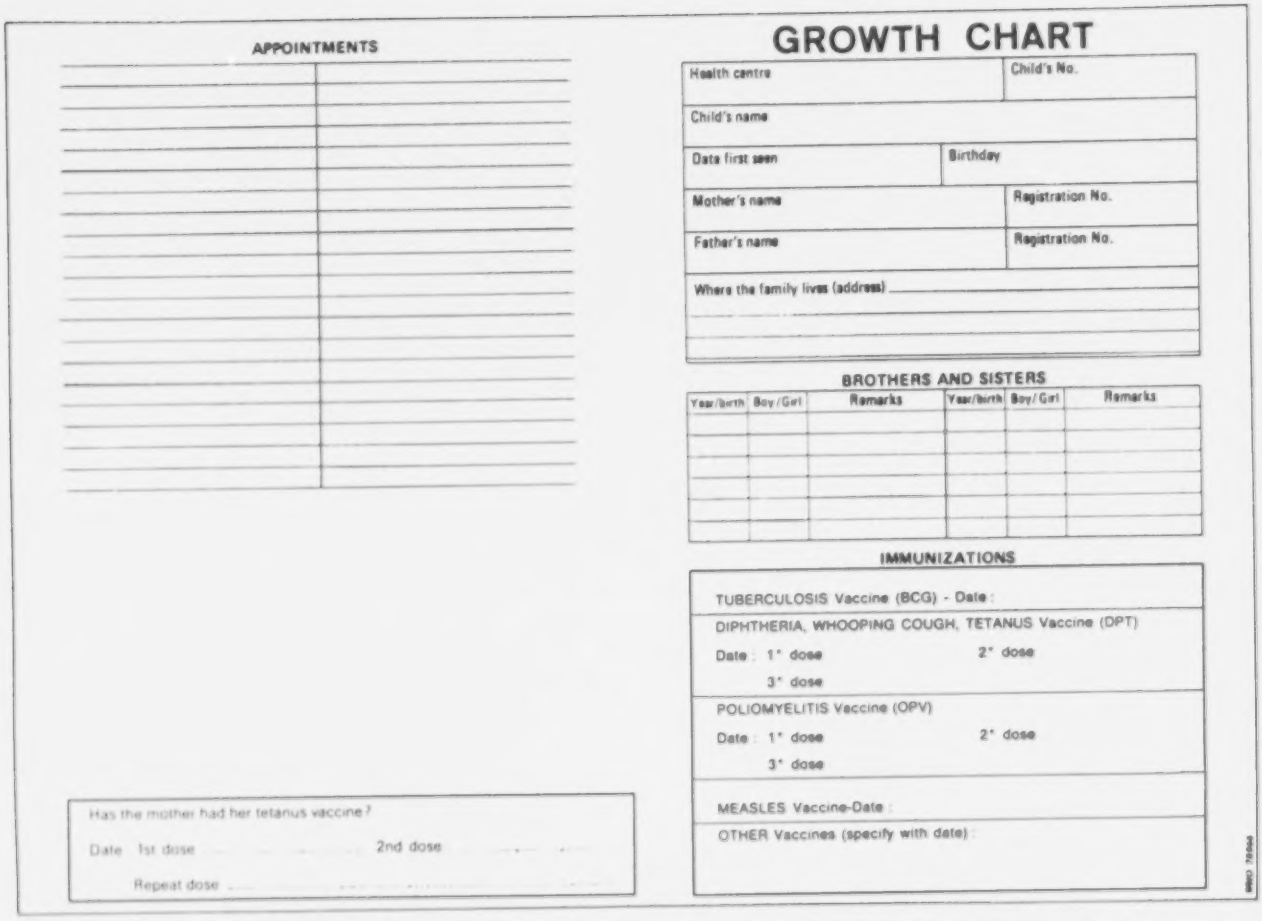


Fig. 6. The back of the growth chart may be used to collect information on the child and the family

On all growth charts, the vertical lines represent the age of the child in months. The horizontal lines represent weight in kilograms, and these weights are marked on the left-hand side of the card. The vertical lines form 12 columns for each year, corresponding to 12 months of the year. The month names can be written in the 12 boxes below the columns. The first box on the left-hand side of the chart is for the month of birth. In the prototype growth chart developed by WHO this box has thick lines around it. The first column for each year also has a box with thick lines around it. This is to identify the beginning of each year of age. The year of birth is marked by the side of the first box indicating the month of birth.

Some other important features of the growth chart are given below:

- *Information about the child and family.* This is written on the back of the graph. The family address and name, the number of children, and their state of health are all recorded (Fig. 6).
- *Immunizations.* There is a space for recording the different dates of immunizations. This also serves as a reminder of when the next immunizations are due.
- *Medical history.* It is convenient to indicate any illnesses suffered by the child on the side of the chart that shows the weight graph. The name of any disease can be written vertically in the month in which it occurs. This makes it easy to see how a disease such as measles seriously affects growth.
- *Additional information.* The same chart can also be used for recording additional information. For example, if a nutrition supplementation programme is being carried out and vitamin A is given every 6 months, a large A can be written at the bottom of the column of the month in which it was given. If food supplements or antimalarial drugs are given monthly a tick can be marked in the column for the

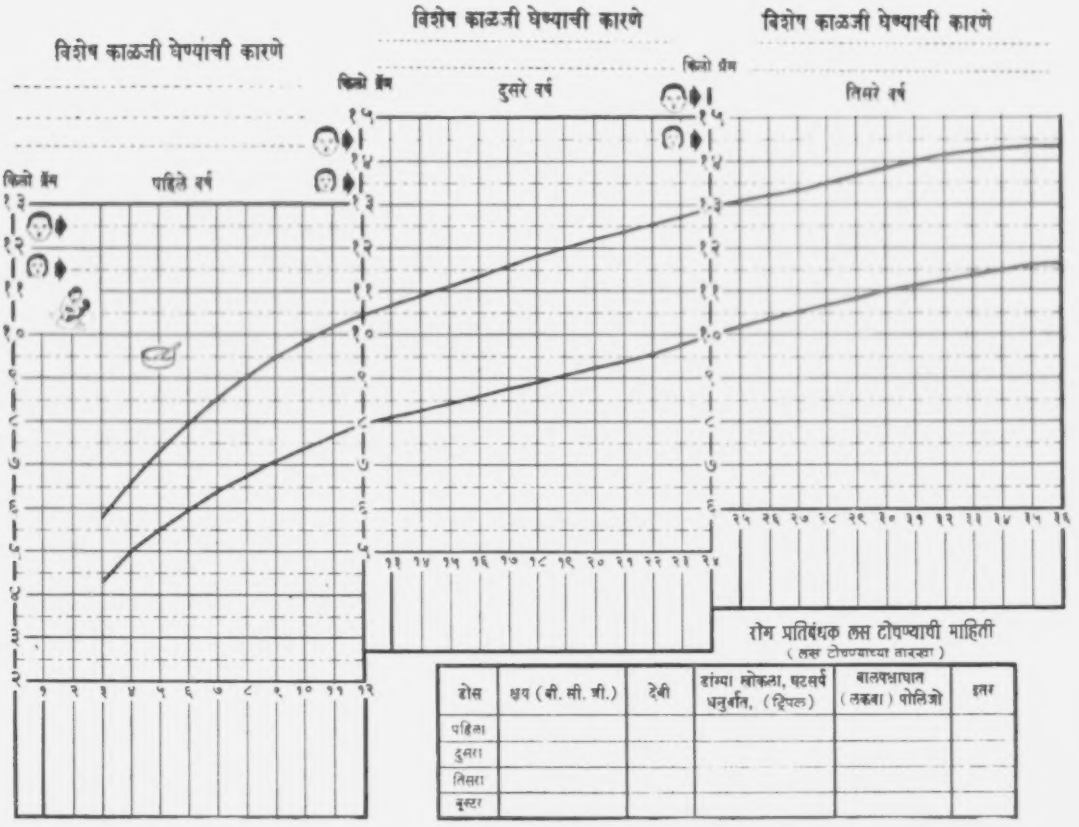


Fig. 7. A growth chart used in India

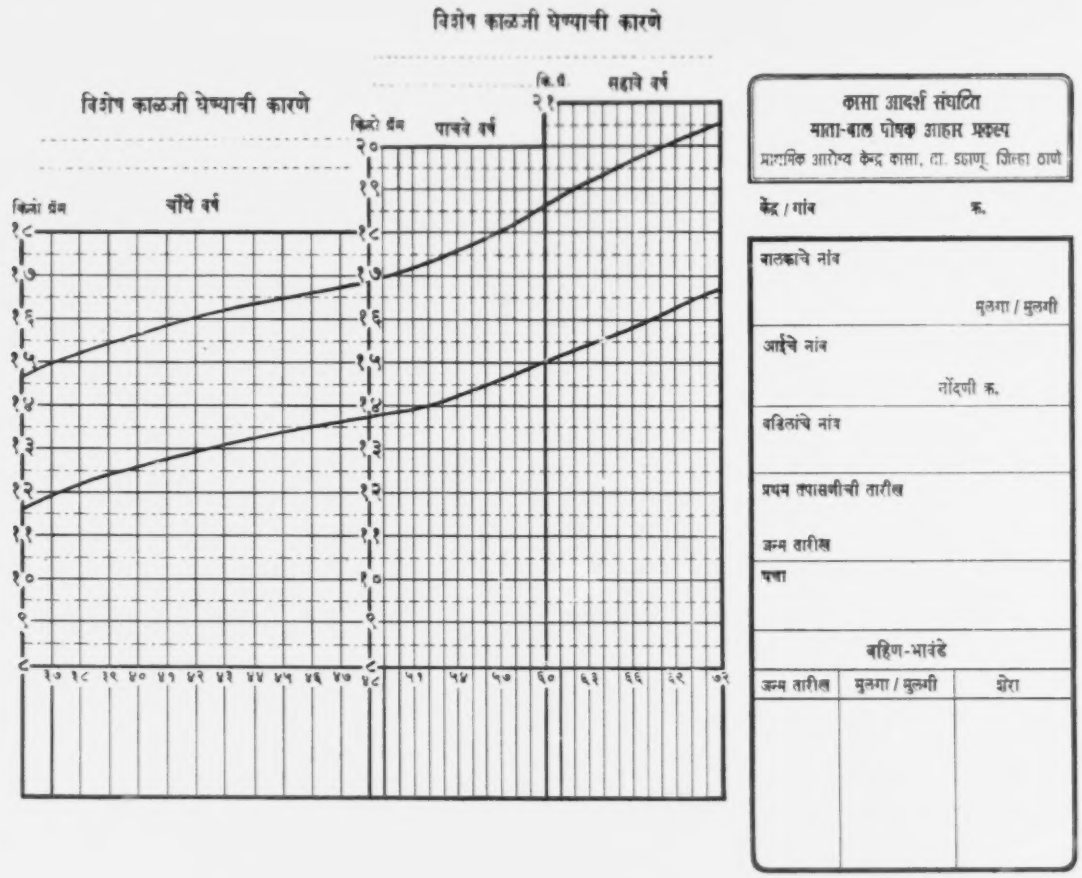


Fig. 7 (*continued*)

appropriate month. Parents are advised to space their children as this permits each child to have a maximum of care and nourishment; if they have been advised, or have accepted some form of contraception, it is good to record this on the chart as well.

- *Reasons for special care.* In Module 1 it was stated that certain social, economic, and health factors are associated with a high risk of malnutrition. The chart has a space to record these factors; it is headed "Reasons for special care". This makes it easy to identify quickly the priority children.

If parents are made to understand the significance of the information on the chart, and then allowed to keep the chart themselves, they will feel more involved and responsible for the child's health care. It saves the time and space needed for storing the charts in a health centre. Also, the charts can be taken with a child during visits outside the community (e.g., to the grandparents' home), or to any health centre. The charts should be put in plastic (polyethylene) covers to help parents keep them clean and dry. Another advantage of asking the parents to keep the cards is that the community health worker does not have to carry them when making home visits. *In the case of children who are at special risk, however, the community health worker should keep duplicate growth charts at the health centre.*

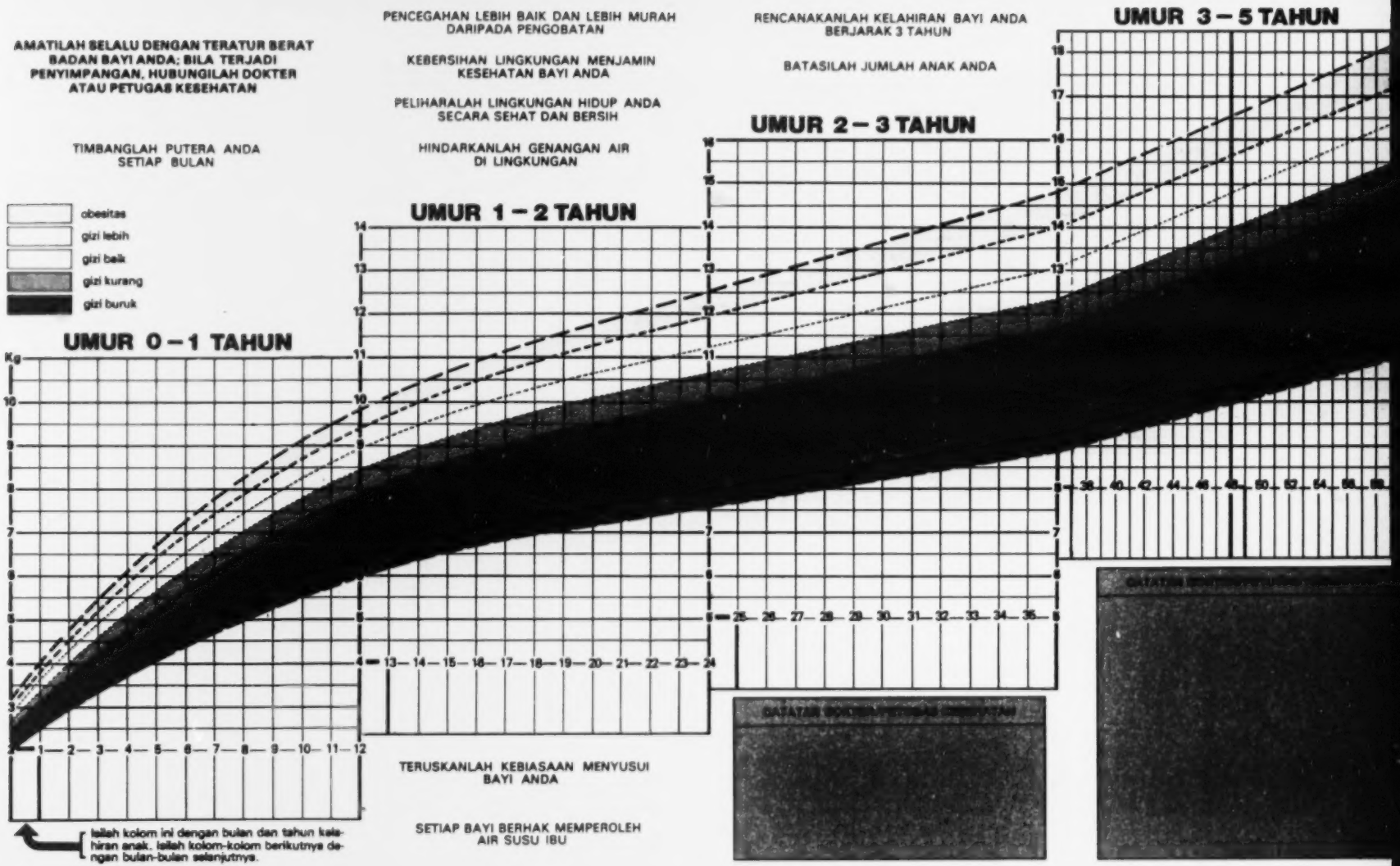

AMATILAH SELALU DENGAN TERATUR BERAT BADAN BAYI ANDA; BILA TERJADI PENYIMPANGAN, HUBUNGILAH DOKTER ATAU PETUGAS KESEHATAN
TIMBANGLAH PUTERA ANDA SETIAP BULAN
PENCEGAHAN LEBIH BAIK DAN LEBIH MURAH DARIPADA PENGOBATAN
KEBERSIHAN LINGKUNGAN MENJAMIN KESEHATAN BAYI ANDA
PELIHARALAH LINGKUNGAN HIDUP ANDA SECARA SEHAT DAN BERSIH
HINDARKANLAH GENANGAN AIR DI LINGKUNGAN
RENCANAKANLAH KELAHIRAN BAYI ANDA BERJARAK 3 TAHUN
BATASILAH JUMLAH ANAK ANDA
obesitas
gizi lebih
gizi baik
gizi kurang
gizi buruk
UMUR 0 – 1 TAHUN
UMUR 1 – 2 TAHUN
UMUR 2 – 3 TAHUN
UMUR 3 – 5 TAHUN
Kg
TERUSKANLAH KEBIASAAN MENYUSUI BAYI ANDA
SETIAP BAYI BERHAK MEMPEROLEH AIR SUSU IBU
Isilah kolom ini dengan bulan dan tahun kelahiran anak. Isilah kolom-kolom berikutnya dengan bulan-bulan selanjutnya.

Fig. 8. A growth chart used in Indonesia

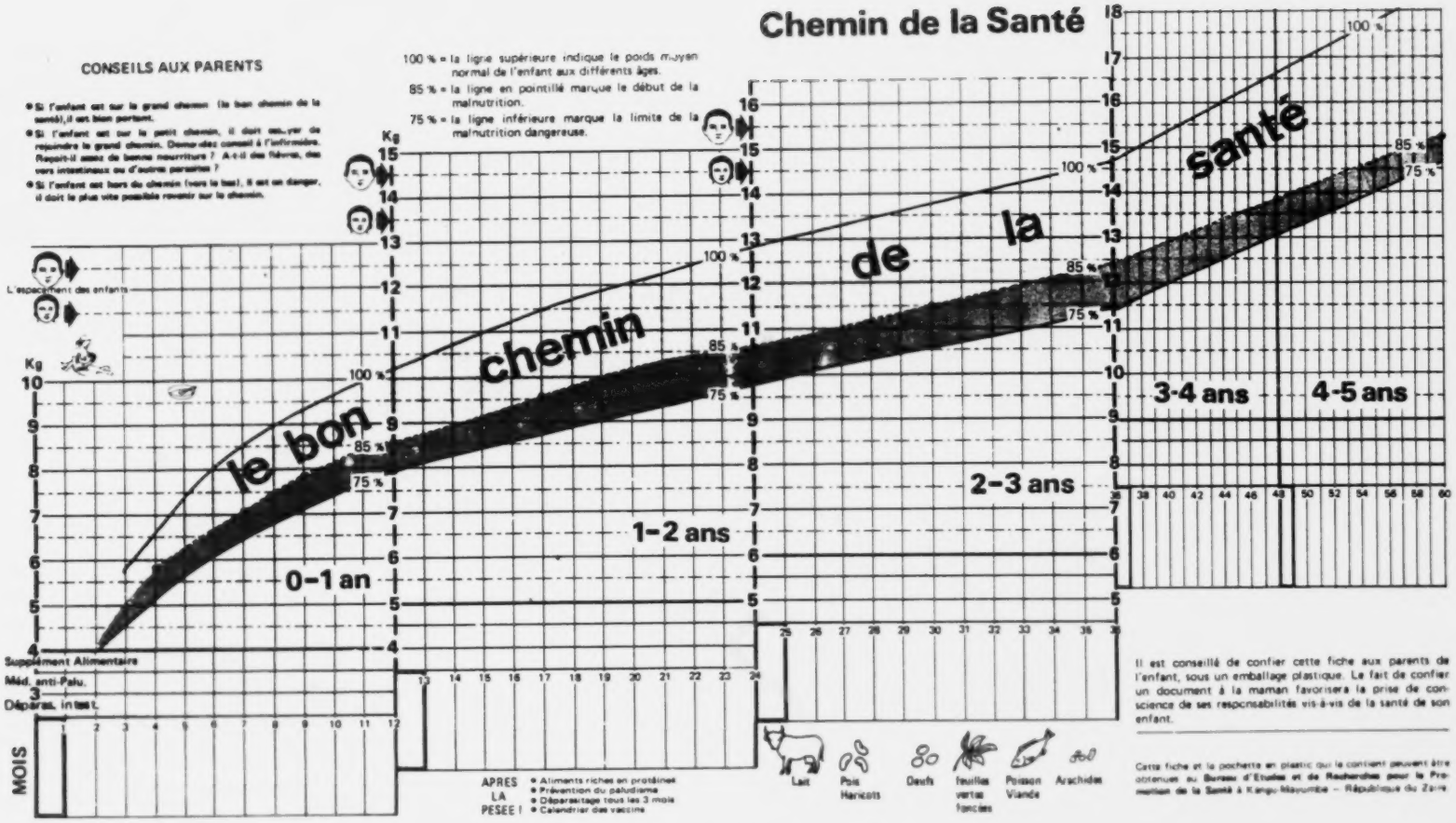
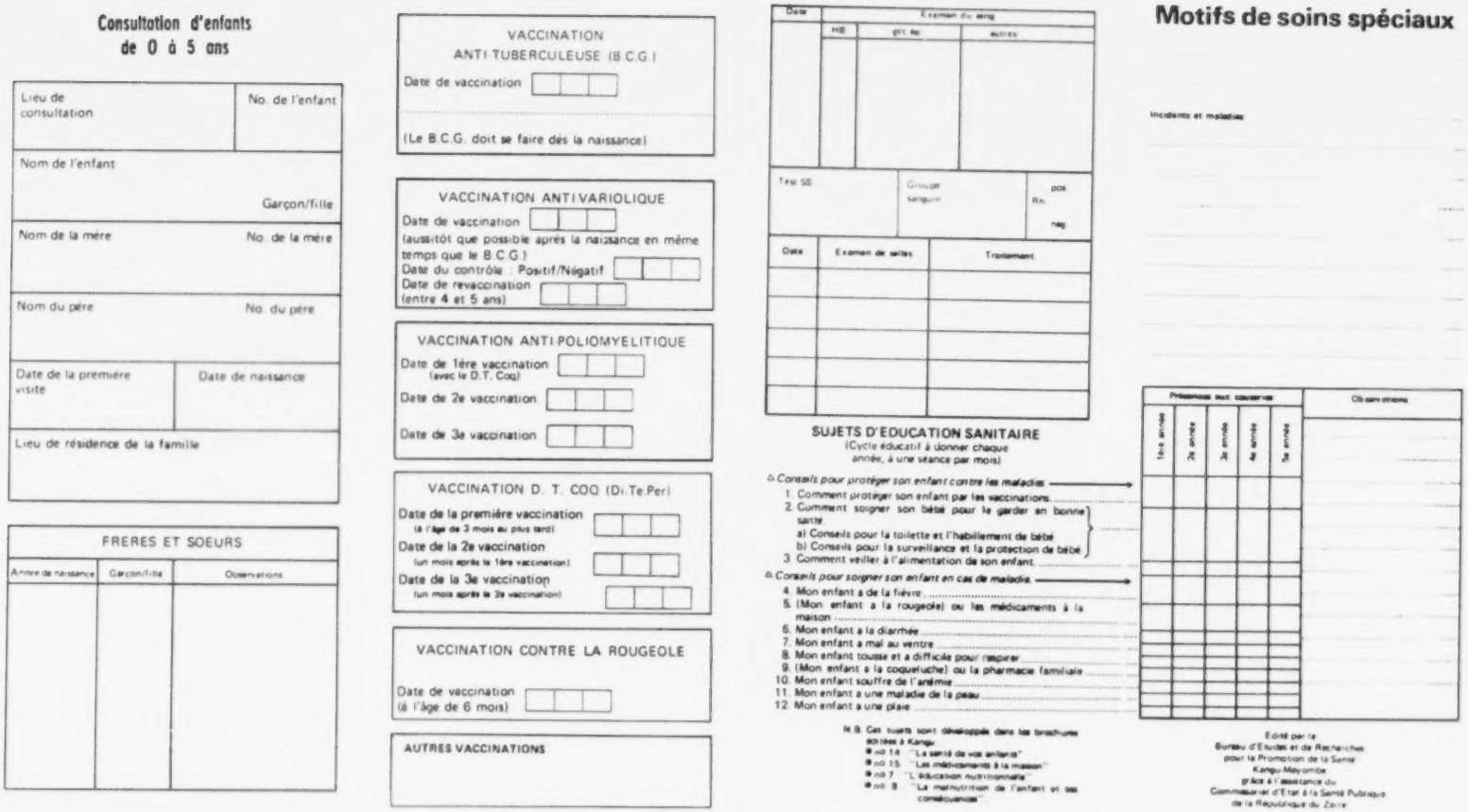

Chemin de la Santé
le bon chemin de la santé
CONSEILS AUX PARENTS
100 % = la ligne supérieure indique le poids moyen normal de l'enfant aux différents âges.
85 % = la ligne en pointillé marque le début de la malnutrition.
75 % = la ligne inférieure marque la limite de la malnutrition dangereuse.
L'espacement des enfants
Kg
0-1 an
1-2 ans
2-3 ans
3-4 ans
4-5 ans
Supplément Alimentaire
Méd. anti-Palu.
Déparas. intest.
MOIS
APRES LA PESEE !
Aliments riches en protéines
Prévention du paludisme
Déparasitage tous les 3 mois
Calendrier des vaccins
Lait
Pois Haricots
Oeufs
feuilles vertes foncées
Poisson Viande
Arachides
Il est conseillé de confier cette fiche aux parents de l'enfant, sous un emballage plastique. Le fait de confier un document à la maman favorisera la prise de conscience de ses responsabilités vis-à-vis de la santé de son enfant.
Cette fiche et la pochette en plastic qui le contient peuvent être obtenues au Bureau d'Etudes et de Recherches pour la Promotion de la Santé à Kenge-Masumbe – République du Zaire

Fig. 9. A growth chart used in Zaire



Consultation d'enfants de 0 à 5 ans

Lieu de consultation	No. de l'enfant
Nom de l'enfant — Garçon/fille	
Nom de la mère	No. de la mère
Nom du père	No. du père
Date de la première visite	Date de naissance
Lieu de résidence de la famille	

FRERES ET SOEURS

Année de naissance	Garçon/fille	Observations

VACCINATION ANTI TUBERCULEUSE (B.C.G.)

Date de vaccination

(Le B.C.G. doit se faire dès la naissance)

VACCINATION ANTIVARIOLIQUE

Date de vaccination
(aussitôt que possible après la naissance en même temps que le B.C.G.)
Date du contrôle : Positif/Négatif
Date de revaccination (entre 4 et 5 ans)

VACCINATION ANTIPOLIOMYELITIQUE

Date de 1ère vaccination (avec le D.T. Coq)
Date de 2e vaccination
Date de 3e vaccination

VACCINATION D. T. COQ (Di.Te.Per)

Date de la première vaccination (à l'âge de 3 mois au plus tard)
Date de la 2e vaccination (un mois après la 1ère vaccination)
Date de la 3e vaccination (un mois après la 2e vaccination)

VACCINATION CONTRE LA ROUGEOLE

Date de vaccination (à l'âge de 6 mois)

AUTRES VACCINATIONS

Date	Examen du sang: HB	gtt. ép.	autres

Test SS — Groupe sanguin — pos. Rh. neg.

Date	Examen de selles	Traitement

SUJETS D'EDUCATION SANITAIRE
(Cycle éducatif à donner chaque année, à une séance par mois)

△ *Conseils pour protéger son enfant contre les maladies* →
1. Comment protéger son enfant par les vaccinations
2. Comment soigner son bébé pour le garder en bonne santé.
   a) Conseils pour la toilette et l'habillement de bébé
   b) Conseils pour la surveillance et la protection de bébé
3. Comment veiller à l'alimentation de son enfant.

△ *Conseils pour soigner son enfant en cas de maladie* →
4. Mon enfant a de la fièvre
5. (Mon enfant a la rougeole) ou les médicaments à la maison
6. Mon enfant a la diarrhée
7. Mon enfant a mal au ventre
8. Mon enfant tousse et a difficile pour respirer
9. (Mon enfant a la coqueluche) ou la pharmacie familiale
10. Mon enfant souffre de l'anémie
11. Mon enfant a une maladie de la peau
12. Mon enfant a une plaie

N.B. Ces sujets sont développés dans les brochures éditées à Kangu
- n° 14 "La santé de vos enfants"
- n° 15 "Les médicaments à la maison"
- n° 7 "L'éducation nutritionnelle"
- n° 8 "La malnutrition de l'enfant et ses conséquences"

Motifs de soins spéciaux

Incidents et maladies

Présences aux séances: 1ère année	2e année	3e année	4e année	5e année	Observations

Edité par le Bureau d'Etudes et de Recherches pour la Promotion de la Santé Kangu-Mayombe grâce à l'assistance du Commissariat d'Etat à la Santé Publique de la République du Zaire

Fig. 9 (*continued — reverse of growth chart*).

Completing the growth chart

Details about the child and his or her weight should be recorded on the chart according to the instructions given below.

1. Write the name, address, and other information about the child and the family on the back of the chart. It is important to do this at once to show whose record this is and to avoid recording one child's weight on another child's chart.
2. Write the month of birth in the box below the first vertical column (the first box which has thick lines around it). Near the box write the year of birth. This is September 1978 in the example shown in Fig. 10.
3. Note that there are five sets of 12 columns. Each set is for one year of the child's life. Beginning with the month of birth (see instruction 2), write out the following months of the year in the following boxes. When you reach January, write the year near that box exactly as you wrote the year of birth (see instruction 2) near the box for the month of birth.
4. Record the weight by putting a big dot on the line corresponding to that weight in kilograms. For example, if the weight of a child is 6 kg in a given month, find the horizontal line representing 6 kg and put a dot at the point on that line where it meets the column for the month in which the weight is being taken. This is January 1979 in the example shown in Fig. 10.
5. The position of the dot within a column can be adjusted. The purpose of this is to indicate when (early in the month, in the middle of the month, or late in the month) the child is being weighed. If the child is being weighed early in the month, put the dot towards the left side of the column. Put the dot in the middle of the column if the weight is being taken in the middle of the month. If the weight is being taken late in the month, put the dot towards the right side of the column.

The above instructions should be followed each time you record the weight on a chart. An example of a growth chart showing the weight of a child taken on three different occasions is shown in Fig. 11. Notice that the three weight dots are joined by a line. *This is the line of growth.* It is very important.

Notice too, that the chart in Fig. 11 is for a different child from the one in Fig. 10. The child in Fig. 11 was first seen and weighed in September 1977 by the community health worker, who questioned the mother as to when the child was born. The month of birth (June 1977) was written in the first box on the chart and the first weight record was placed in the fourth column (September).

How to interpret the growth line

Look carefully at the growth line in Fig. 11. Note that the line is going upwards from left to right, from 5.5 kg in September to 6.5 kg in November and then to 7 kg in January 1978. Remember that when the line is going up, the child is growing; this is good. If the line is horizontal or going down the child is not growing well, and this is not good. Some charts have examples of the direction of the growth line printed below the chart. This is to remind health workers that the direction of the growth line, upwards, horizontally, or downwards, is very important.

> In the first 6 months of life a levelling off or a downward movement of the growth line is a serious matter

The importance of the *direction* of the growth line is illustrated in Fig. 12. Arrows A, B, C, and D have been drawn on the growth line parallel to the growth line for different periods. The growth chart parallel to arrow A is good. The growth line parallel to arrow B is not satisfactory and action should have been taken. When the growth line fell, parallel to Arrow C, the child was in a dangerous condition and urgent action was needed. *Any child who does not gain weight for 3 months should be referred to the supervisor or health centre.* When the growth line returned to the direction of arrow D, the child's growth became normal again.

> Increase in weight with age is more important than weight on any one occasion.

Remember that it is the direction of the growth line that is more important than the position of the dots on the line. The dots parallel to arrow B are above the lower reference line, but the growth line is levelling off and this is a matter for concern. The dots

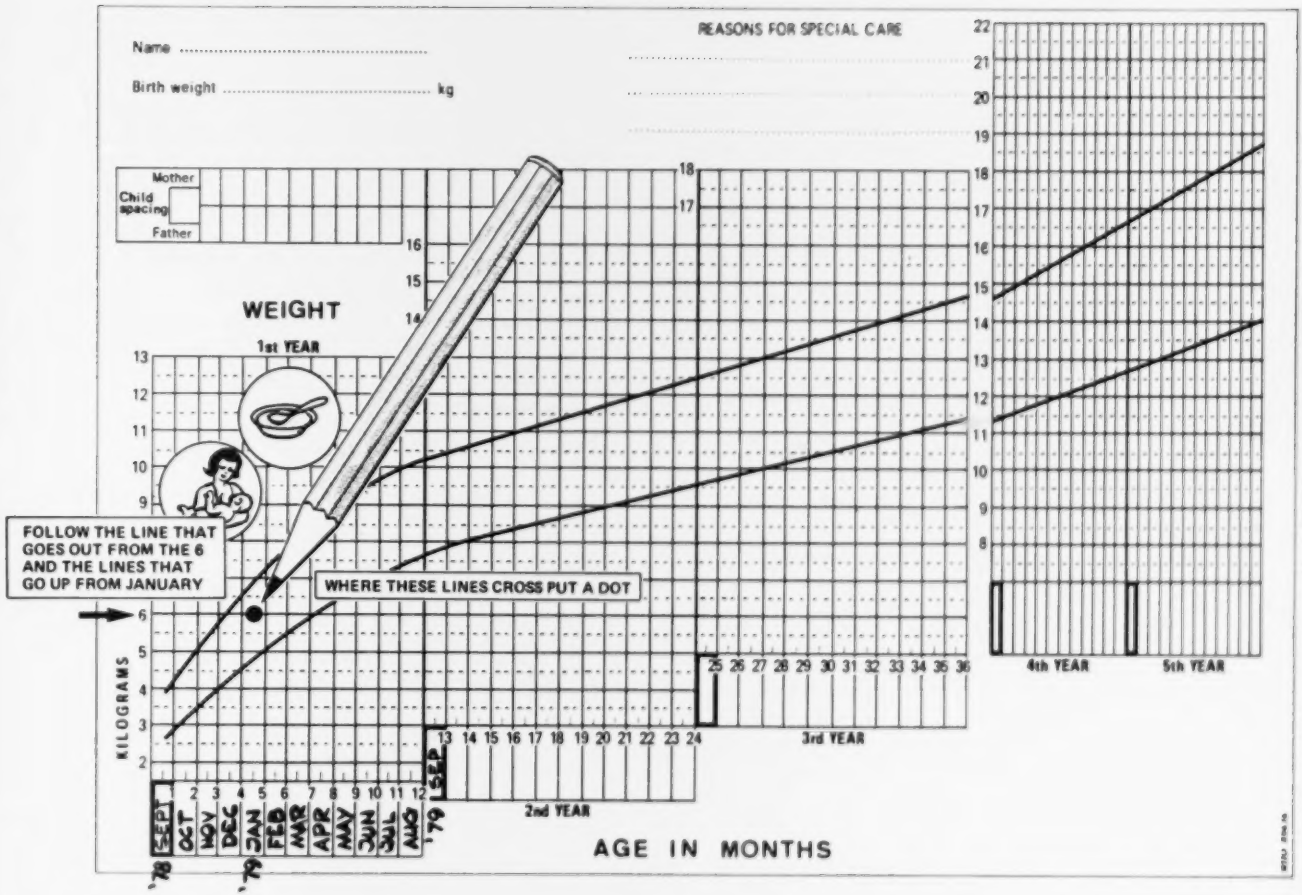


Fig. 10. Recording the weight on a growth chart

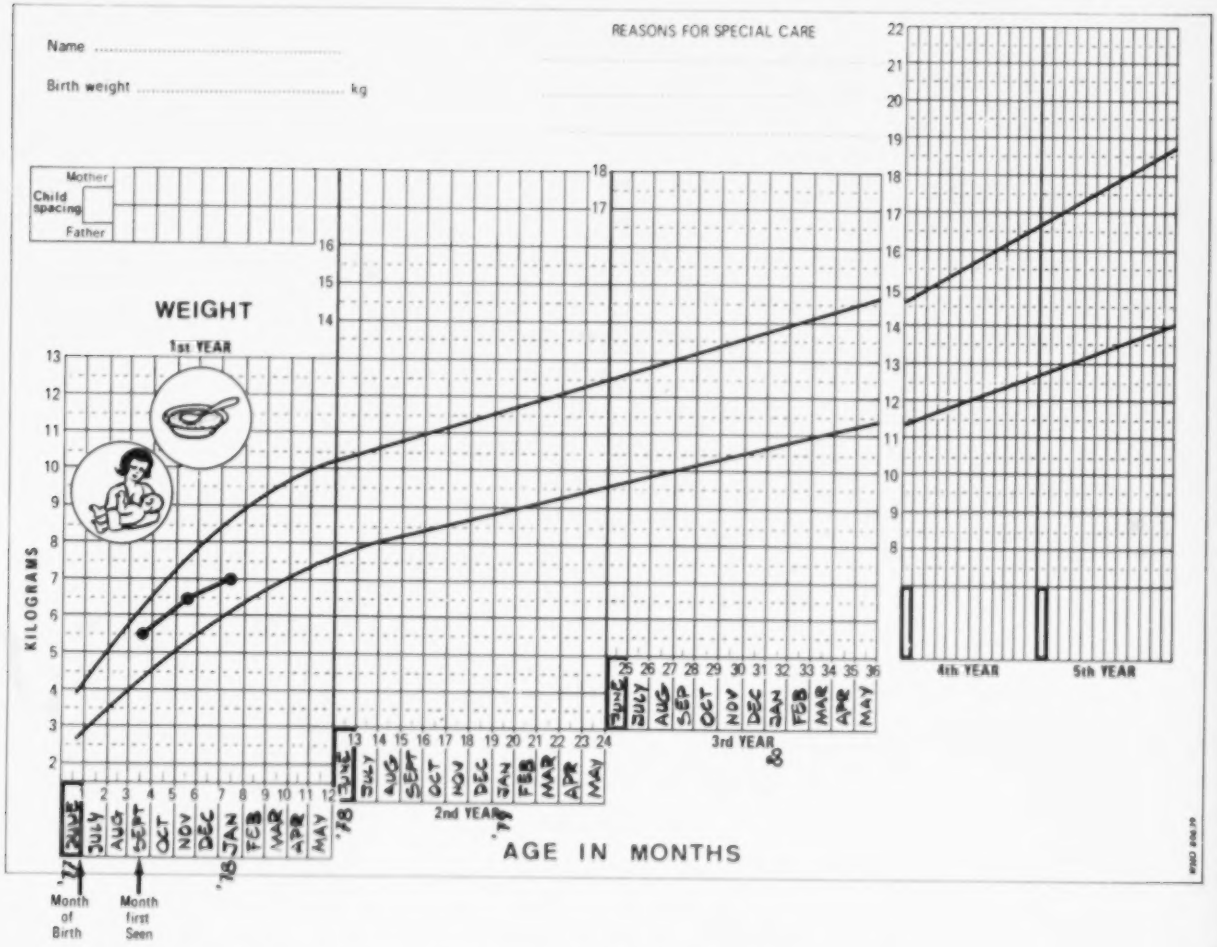


Fig. 11. An example of a growth line joining three weight measurements

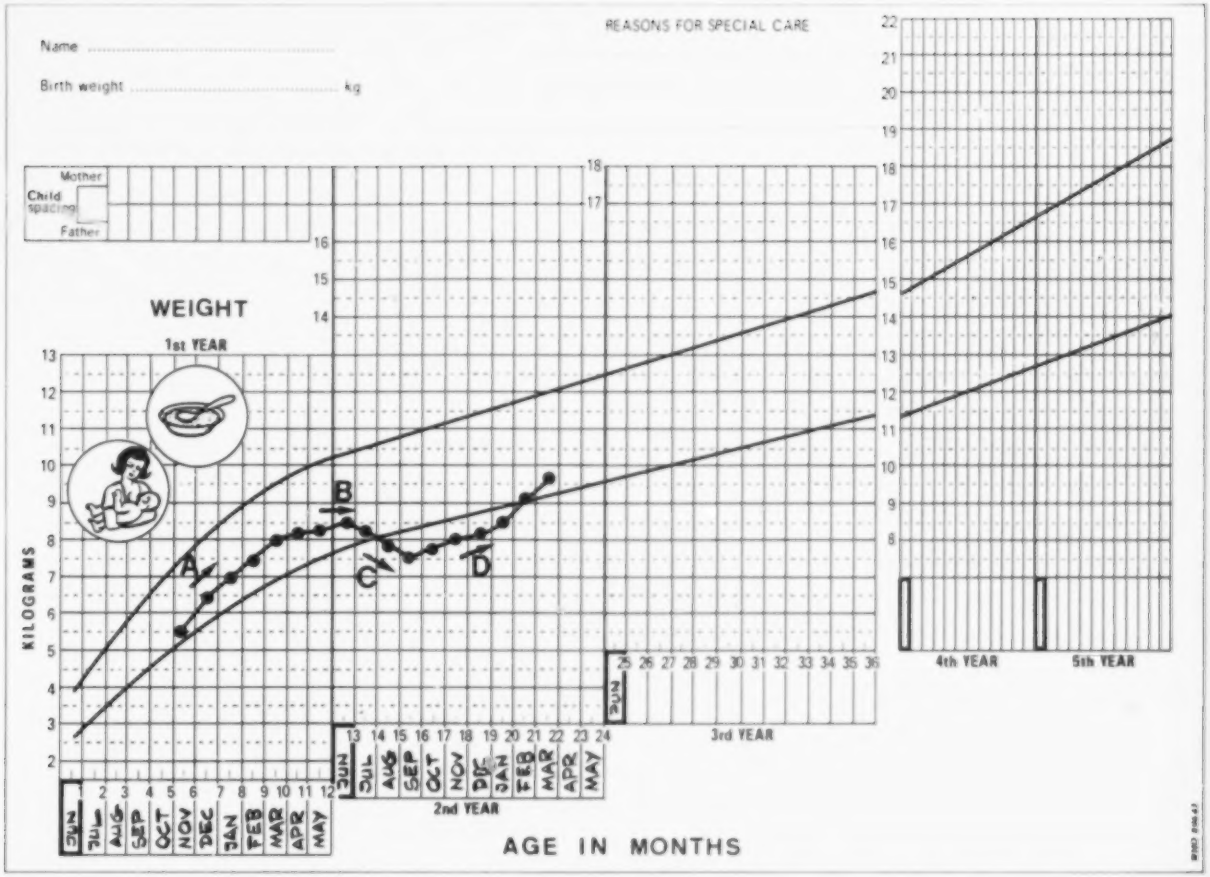


Fig. 12. The direction of the growth line is most important

parallel to arrow D are below the reference lines, but the direction of the growth line is once again upwards and therefore the mother should be congratulated for her good care.

> The direction of the growth line is more important than the position of the dots.

How to measure the nutritional status of children

There is no easy and satisfactory way to measure the nutritional status of a child at a single examination. Two methods that are widely used are described below, but neither of them is ideal, and it is better to use the growth chart just described to see what direction the growth line takes.

Weight-for-age (Gomez-type) nutrition classification.

In this classification, the average weights of a series of children (up to 5 years of age) of different ages are used as standard. A curve representing this standard is drawn across a growth chart. Below it are drawn parallel curves representing 90%, 75%, and 60% of the standard weights (Fig. 13). Sometimes 80%, 70%, and 60% lines are also drawn. According to this system, if a child's weight dot at any age is between the 90% and 75% line, he is considered to have first-degree malnutrition. If the weight dot is between the 75% and 60% lines, he has second-degree malnutrition. If the weight dot is below the 60% line, he is said to have third-degree malnutrition.

Although this classification is widely used, it should be borne in mind that a full diagnosis of the nutritional status of the child should not be made on this basis alone. A child may be heavy for his age, but if he is not growing (i.e., if his growth curve is not moving upwards) he can be in danger. Similarly, a child may be light for his age (the weight dot being below the 75% line) but he will not be in serious danger as long as his growth curve is moving upwards.

Assessing nutritional status by measuring mid-upper-arm circumference

A child's upper arm grows very slowly between the ages of 1 and 5 years. The distance around the middle of the upper arm (mid-upper-arm circumference) of all well nourished

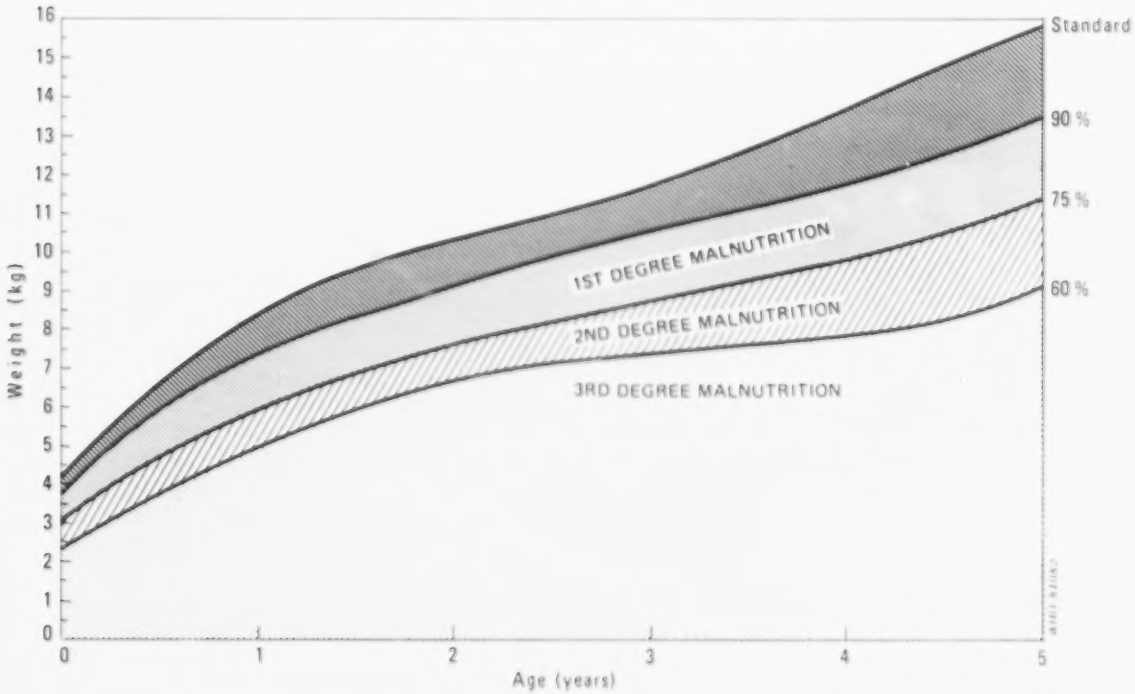


Fig. 13. Gomez-type classification of malnutrition

healthy children is more or less the same. If a child is undernourished and is not growing well, the arm becomes thin and the mid-upper-arm circumference reduces. The more severe and prolonged the malnutrition, the thinner will be the upper arm (Fig. 14). By measuring the middle of the upper arm of children, using a tape or a special three-colour measuring strip (Fig. 15), one can find out whether a child is malnourished or not. Note that you cannot use the measuring strip to find out how a child is growing month by month. For that you have to use a growth chart.

A special three-colour measuring strip is easier to use than a measuring tape. It can be easily made from string or a strip of material that does not stretch. But be careful that the markings are accurate.

To use the three-colour measuring strip:

Put the strip around the child's upper arm (half-way between the elbow and the shoulder) and see which colour on the strip meets the marker line (see Fig. 14).

- If the marker line is over the *green* part, the child is healthy and well nourished.
- If the marker line is over the *yellow* part, the child is moderately undernourished. In such cases, the mother should be warned about it. The community health worker should find out why the child is undernourished, and should then give proper advice to the mother.
- If the marker line is over the *red* part, the child is severely undernourished and is in danger. Such a child can fall ill easily and may even die if he is not helped quickly. He should be given more foods of the right type. If there is any special feeding programme for malnourished children in the area, the child should be included in it immediately so that he can get supplementary foods. It is always advisable to get such children examined by the supervisor or by a doctor in the health centre.

- The three-colour measuring strip is good for identifying children in danger.
- This strip is not suitable for measuring growth.

Fig. 14. Identifying malnourished children by using a three-colour measuring strip

Weight-for-height method of assessing nutritional status

Another method of assessing the growth of a child is to measure his height and compare it with the desirable height for his age. This method is not commonly used because it is not easy to measure the height of a child accurately. For infants who cannot stand, the length of the body is measured. This can be difficult and requires the use of a special instrument. In some countries, the weight of a child in relation to his height is compared to a desirable standard. In this method, the big advantage is that there is no need to determine the age, which is also not an easy task in many situations.

In most developing countries, watching the growth of children by weighing them at regular intervals and recording the weight on

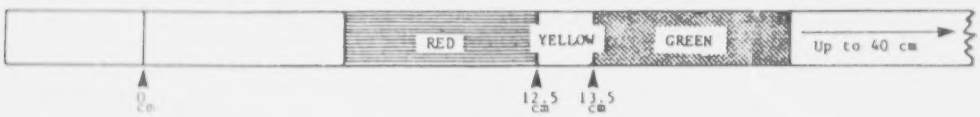


Fig. 15. A three-colour measuring strip

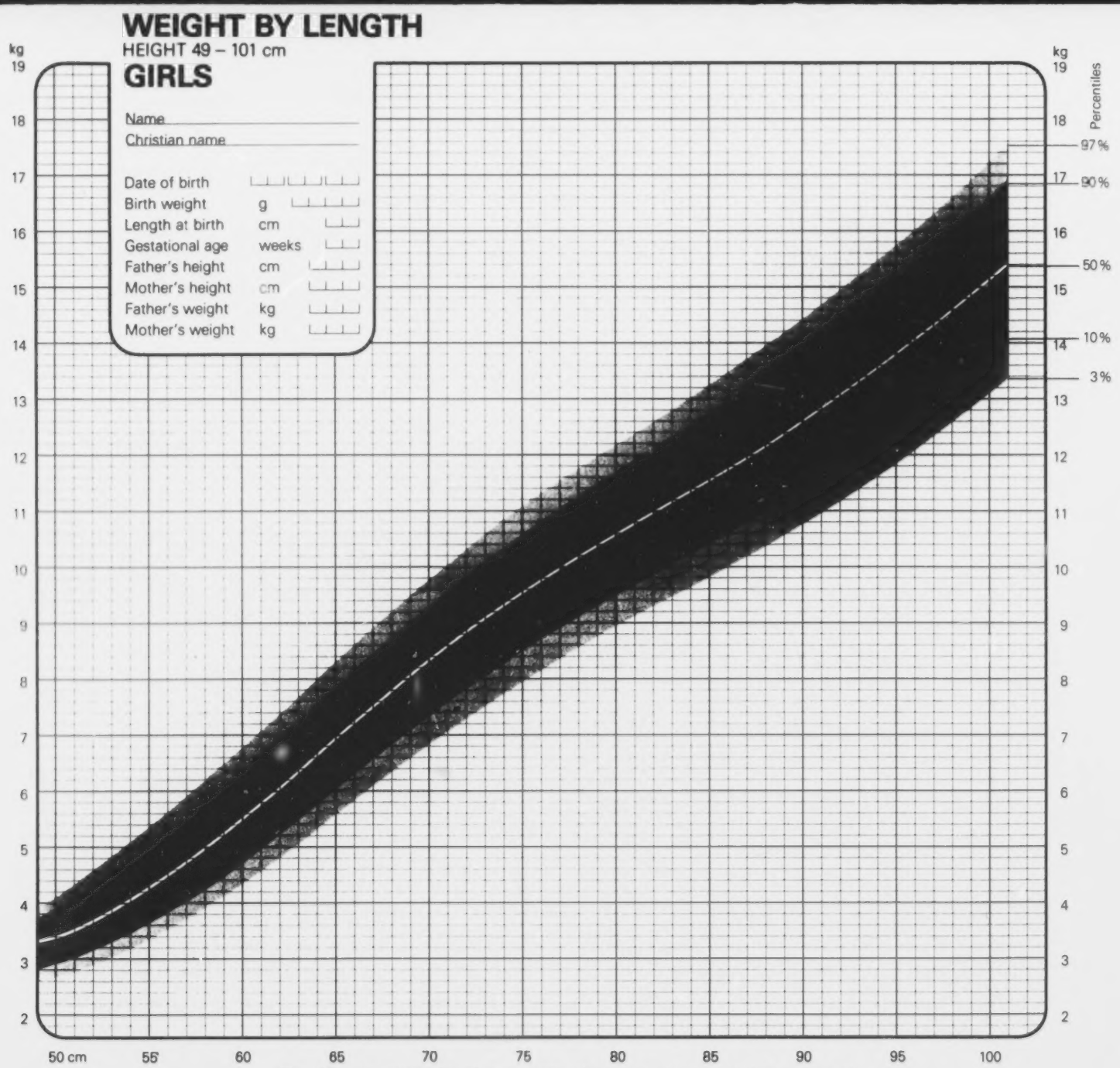


Fig. 16. An example of a growth chart based on weight-for-length

a growth chart is the most common method of assessing nutritional status. In some other countries, the weight-for-height method is used. In yet others, where weighing scales are not easily available in all places, the three-colour strip for measuring mid-arm circumference is commonly used.

The weight-for-height method of assessing nutritional status is useful in two situations:

- For screening malnourished children in the community, weight-for-height is the best method. In most developing countries, an added advantage of this method is that it is not necessary to know the age of the child, which is sometimes difficult to ascertain in rural areas.
- For monitoring growth of children over a limited period, weight-for-age is the simplest method.

An example of a growth chart based on weight-for-body length of female children is shown in Fig. 16.

TRAINING METHODS

1. *Lecture*: Training content.
2. *Demonstration*: Weighing a child, recording weights on a growth chart, and assessing nutritional status of children by different methods.
3. *Group discussion*: Interpretation of prerecorded growth charts.
4. *Practical exercises in a clinic or health centre*: Weighing children and recording weights on growth charts and interpreting the recorded weights.
5. *Role-playing*: Filling in a growth chart for a new baby (see exercise 4) or other similar exercises.

EXERCISES

Exercise 1. Making your own local-events calendar

In this exercise the trainees make their own local-events calendar. They should make it on the basis of the description of a local-events calendar on page 00, borrowing calendars that give information such as the phases of the moon in the past few years and adding important local events; especially religious festivals celebrated in the area, fairs, visits from circuses, serious storms, and similar happenings that people in the community are likely to remember easily.

Exercise 2. Making and interpreting a growth chart

In this exercise the trainees practise how to make a weight chart and how to interpret a growth line. A blank weight chart is provided for each trainee.

1. Using the information given below fill in the blank weight chart provided to you.

A girl was born in May 1976. Her name is Laxmi. She was weighed on different months following her birth. The weights in each of the months are given below.

1976	May	3.0 kg	1977	June	7.5 kg
	June	4.0 kg		September	9.0 kg
	July	4.5 kg		October	10.5 kg
	August	5.5 kg		December	11.5 kg
	September	6.0 kg	1978	January	11.5 kg— Stopped breast-feeding
	October	6.5 kg			
	November	Did not attend		February	11.5 kg
	December	7.0 kg		April	10.5 kg
1977	February	Had measles		June	12.0 kg
	March	6.5 kg had diarrhoea		July	11.5 kg
				November	12.0 kg— Brother born
	April	6.0 kg put under special nutrition care		December	11.5 kg
			1979	February	11.5 kg
				April	12.5 kg
	May	6.5 kg			

2. Put the dots in the right columns for the weights given above.
3. Join these dots by a line and draw a growth line.
4. Turning the chart sideways, write out important information (e.g., diarrhoea and special nutrition care) in the appropriate columns.
5. Now answer the following questions.

(*a*) How old was Laxmi in: December 1976? .....
April 1978? .....

(*b*) Why do you think Laxmi did not gain weight between January and April 1978, and between December 1978 and February 1979?

.....
.....

(*c*) What special help and advice would you give Laxmi's mother in:

February 1977? .....
January 1978? .....

Exercise 3. Practising weighing a baby and filling in a growth chart

Hang up a spring scale and ask the trainees to gather around it and sit comfortably. Give each trainee a growth chart. Tie a doll to the handle of a bucket and hang the bucket on the scale. From a second bucket pour some water into the first bucket until the weight on the scale reads 3 kg. This is the birth weight of the imaginary baby. Ask the trainees to write the present month in the appropriate box and put a weight dot in the correct column. Then ask them to write the subsequent months in the appropriate boxes. Next ask one trainee to come up to the scale and pour some more water in the hanging bucket and read out the new weight on the scale. This will be the weight for the next month. Again ask the trainees to put the weight dot in the appropriate column. Repeat the procedure by asking the other trainees to come up to the scale one by one and add water to the hanging bucket. From time to time, ask a trainee to remove some water from the bucket, to represent loss of weight. This might be caused by an illness or by stopping breast-feeding; the trainees should also enter these events on the chart.

This type of exercise is sometimes called a "simulation exercise" because it simulates (it is like) the real-life situation. You can also use a flannel graph to demonstrate how to fill in a growth chart.

Exercise 4. Role-play about filling in a growth chart for a new baby

In role-play the trainees act out typical real-life situations they are likely to encounter when they become community health workers. By playing different roles they learn about the attitudes of different types of people they will meet in the community.

An example is given below. In this play a mother comes for the first time with her new baby to the community health worker. The community health worker takes this opportunity to fill in a growth chart for the new baby and to give the mother some advice on immunization. The name of the mother in this story is Mrs Kartini.

Community health worker	Good morning Mrs Kartini. How are you and your new baby?
Mrs Kartini	Good morning. I am very well, thank you, and my baby is also doing well.
Community health worker	The first thing we will do is make a growth chart for your baby. This will be a record of his health. I will explain this later. Do you mind if I ask you some questions about the baby?
Mrs Kartini	No, I don't mind.
Community health worker	First, what is your baby's name?
Mrs Kartini	His name is Peter.
Community health worker	Your full name is Lika Kartini, is that right?
Mrs Kartini	Yes.
Community health worker	What's your husband's full name?
Mrs Kartini	He's called David Kartini.
Community health worker	On what date was Peter born?
Mrs Kartini	I don't remember exactly. It was in the first week of July, the day after the village school closed for the holidays.
Community health worker	Thank you. That will have been Friday, the sixth of July. I will now write the months in the chart. What is your home address?
Mrs Kartini	I live in Madang Street. There is no house number, but we live near the village well.
Community health worker	How many brothers and sisters does Peter have?
Mrs Kartini	Only one. A brother.
Community health worker	What's his name?

Mrs Kartini	John.
Community health worker	Do you have a growth chart for John?
Mrs Kartini	No.
Community health worker	Do you know John's date of birth?
Mrs Kartini	No, but he has always been quite healthy!
Community health worker	He should have some immunization, to stop him becoming ill. If you agree, I will give him an immunization against tuberculosis today. First of all, I want to weigh Peter. (After weighing). Peter's weight is six and a half kilograms. I will now put a large dot on the chart, opposite 6.5 kg above this month, which is September. You can see that I have written the names of the months in the boxes at the bottom of the chart. I started with July, in the first box on the left. This is because Peter was born in July.
Mrs Kartini	Is that a good weight?
Community health worker	Yes, that is a good weight for a two-month old baby, but we must weigh Peter each month in order to be sure that he is gaining weight regularly. That will mean he is growing well and is healthy. Now I want to ask you some more questions. First of all, what are you giving Peter to eat?
Mrs Kartini	I only breast-feed him.
Community health worker	That's good. It is best if you keep breast-feeding him as long as possible, until he is two years old, or even older. When he is 5–6 months old, you can start to teach him to taste other foods, in addition to breast-milk, and gradually increase the amount of food.

Exercise 5. Interpretation of growth charts

Look carefully at the weight charts of Tola, Raman, Jose, and Sara (Figs. 17, 18, 19, and 20). Trainees should be able to make several comments about each chart and about the risks to and the progress of each child. Ask one trainee to explain each chart and then discuss the chart together.

Compare the growth and the general situation of Tola and Jose in the first 9 months of their lives. In what ways were they similar, and in what ways did they differ?

Look at the growth charts of Raman and Jose. When they were both 1 year old, what advice on nutrition would you have given to their mothers?

Exercise 6. Identifying mistakes on growth charts

Look carefully at the growth charts of Leela and Tanete (Figs. 21 and 22). Can you see any mistakes or unexpected results on the charts?

Discuss how to avoid mistakes of the type shown on these charts.

Exercise 7. Field evaluation of use of weight charts

1. Visit a village, and systematically call at each house where there are children under 5 years of age. What proportion of children have growth charts? How many children had charts but their parents have lost them?

(This indicates how effectively the service covers the whole community).

2. At a clinic or during home visits check a number of charts to see if the items given below have been correctly filled in:

—Child's name and address
—Family members and state of health
—The months and years in the calendar
—Weight dots and lines

—Risk factors. Have these been written in when appropriate?
—Illnesses. Have these been written in?
—Family planning advice given to parents and the attitude and action of the parents
—Immunizations. How many immunizations have been given to children over 1 year of age?

(This indicates how well trained and how careful the health personnel are in using weight charts).

Exercise 8. Frequency of weight measurement

At a clinic or during home visits note how many times children have been weighed in the 1st, 2nd, and 3rd year after birth. This is done by adding the number of dots on the growth chart for each year.

(This indicates how often there is contact between the children and the health services).

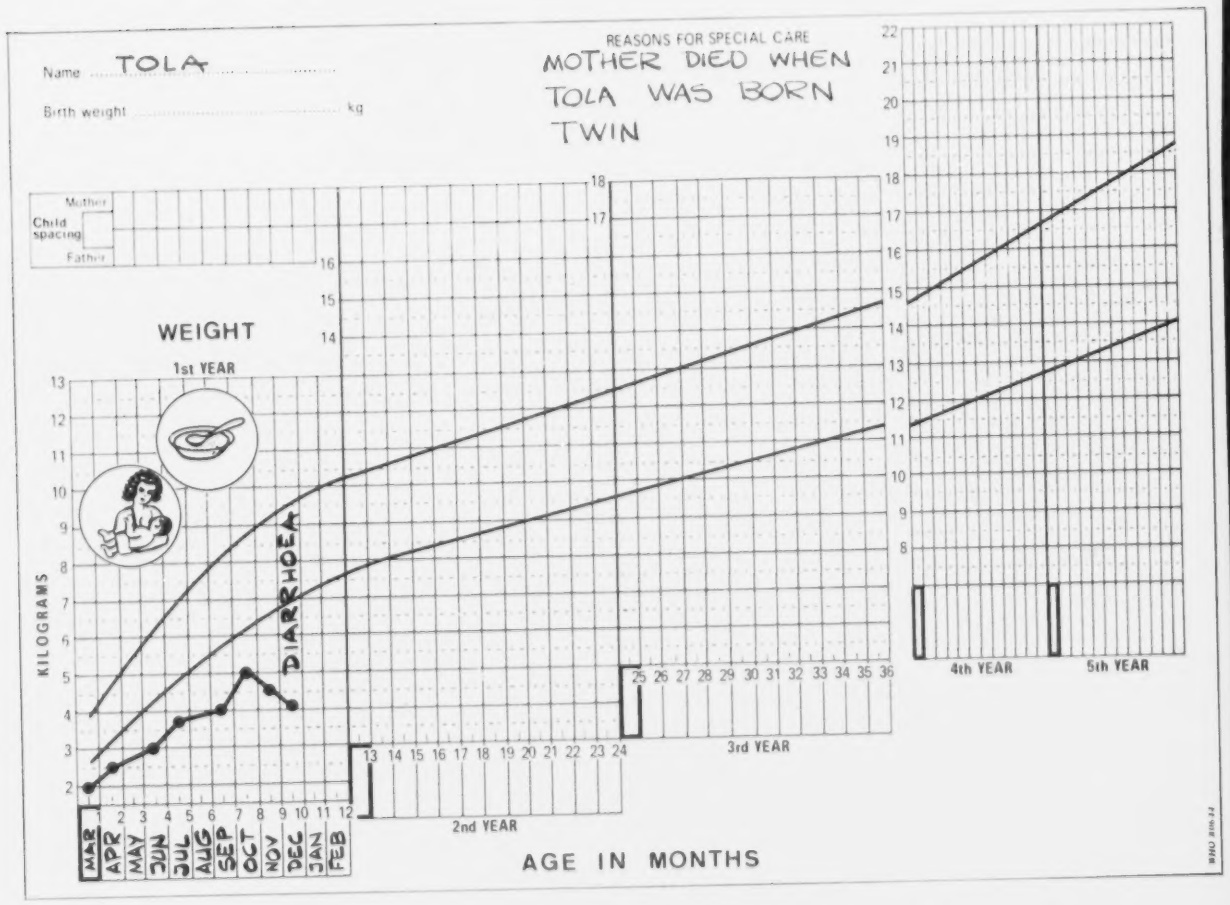


Fig. 17. Growth chart of Tola

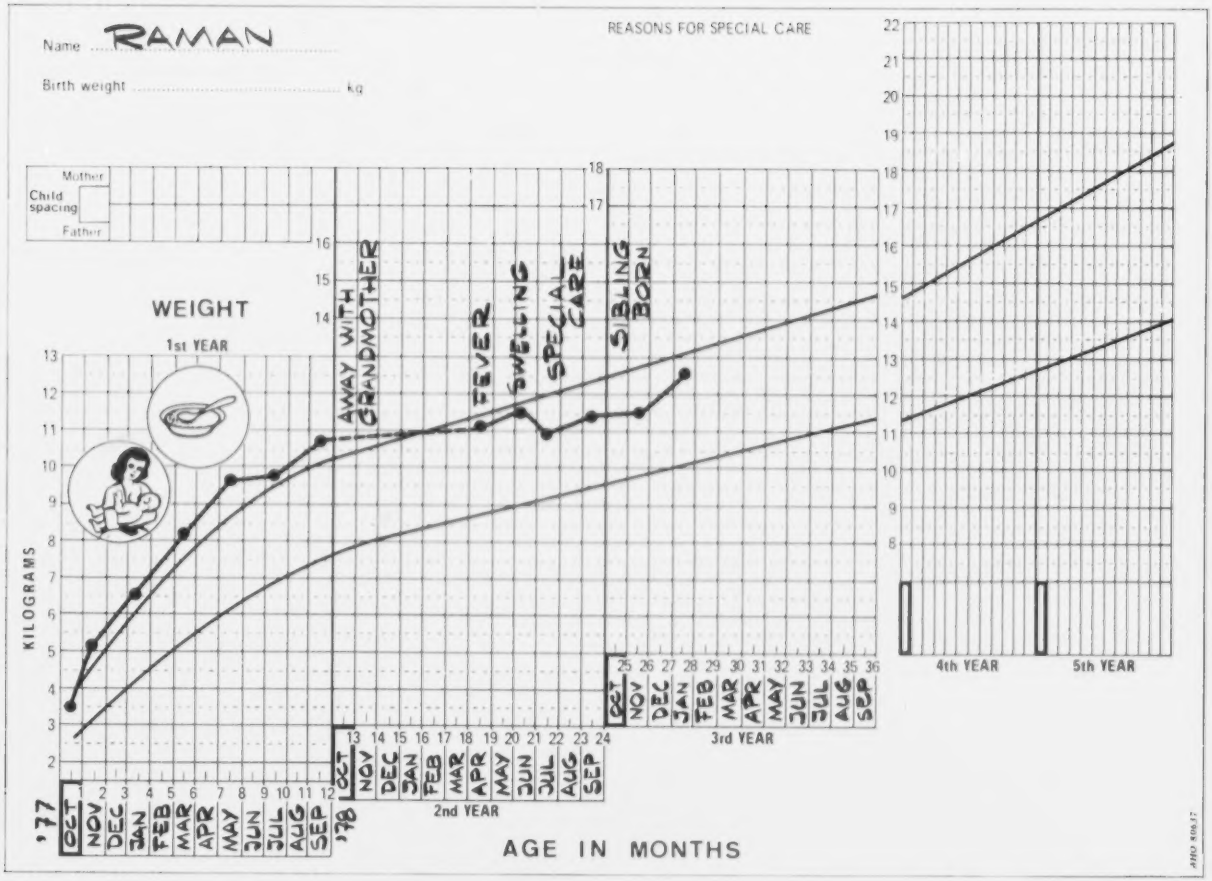


Fig. 18. Growth chart of Raman

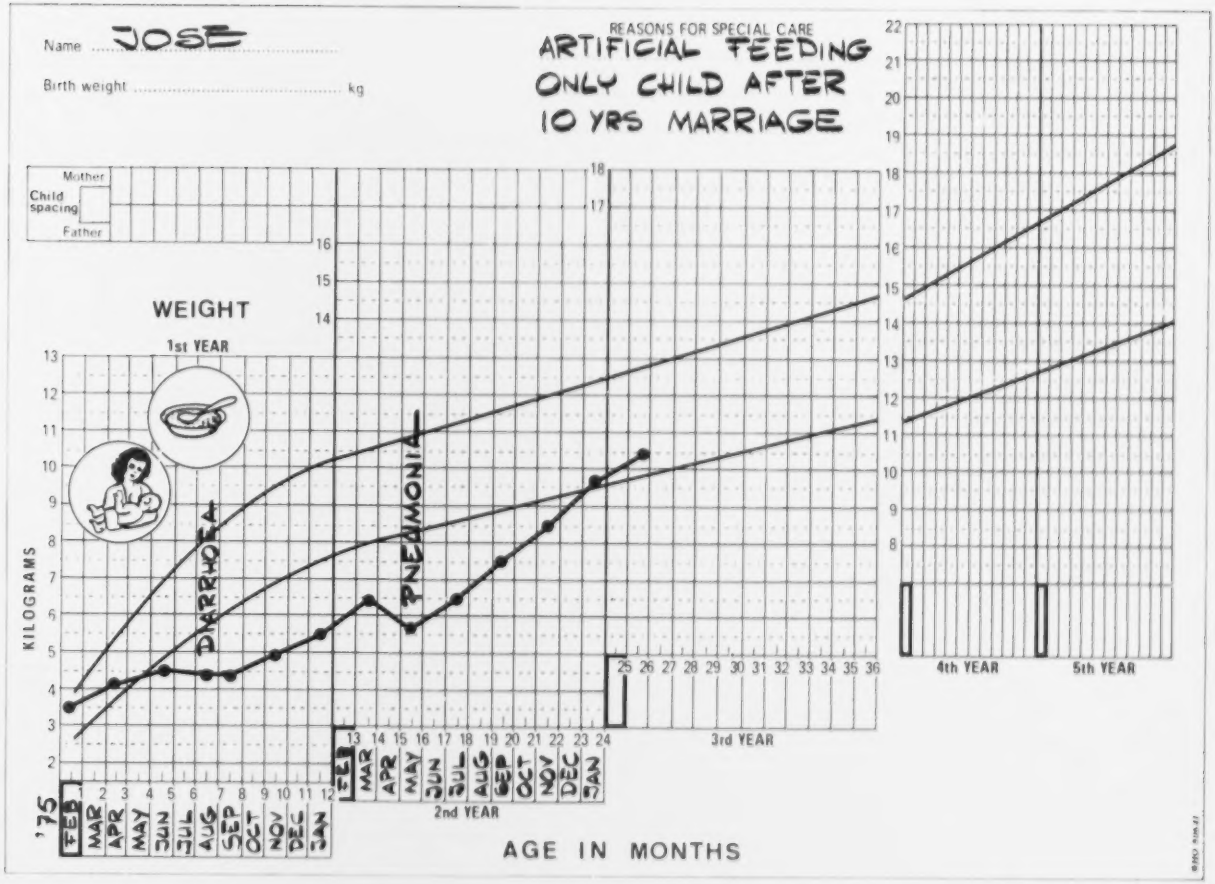


Fig. 19. Growth chart of Jose

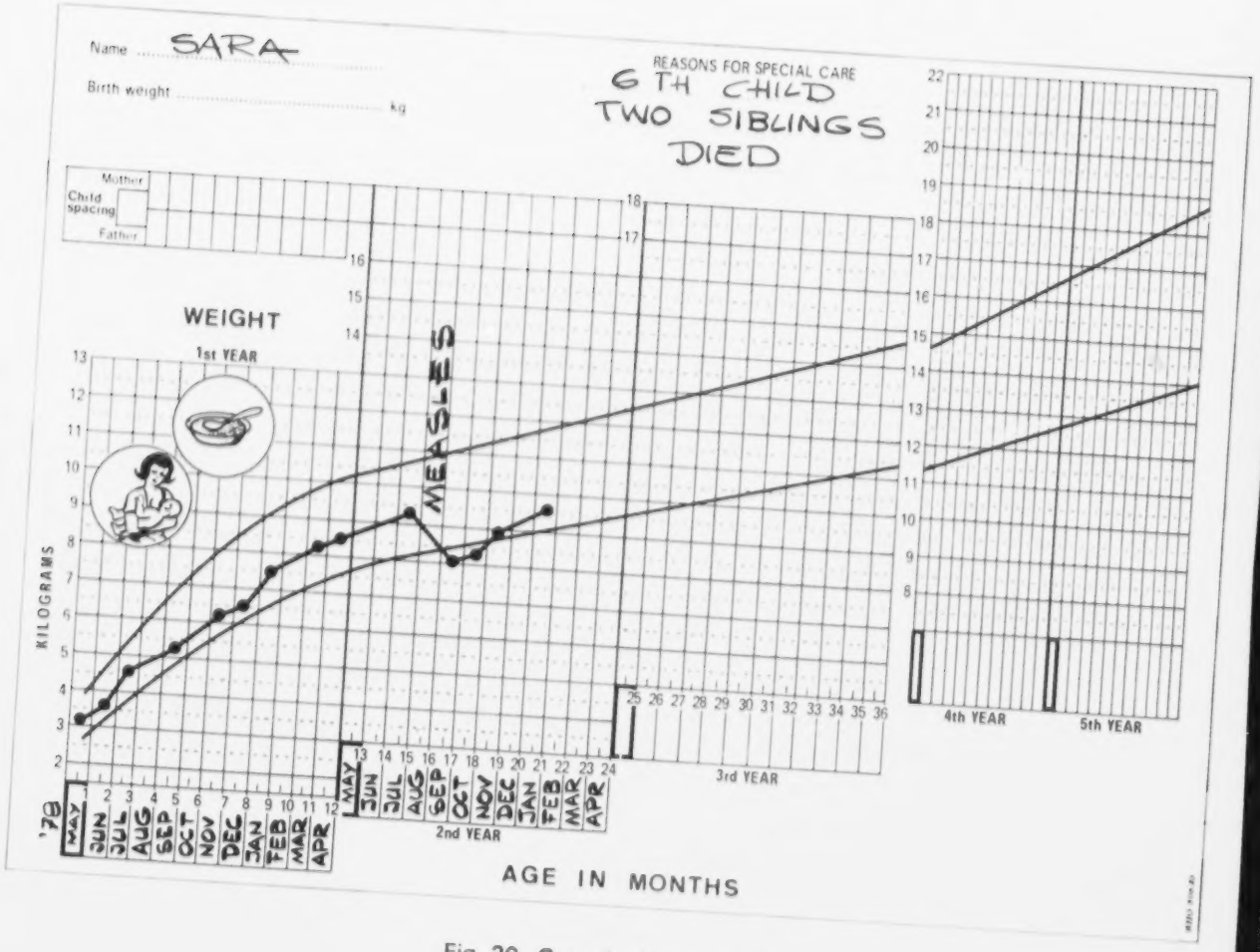


Fig. 20. Growth chart of Sara

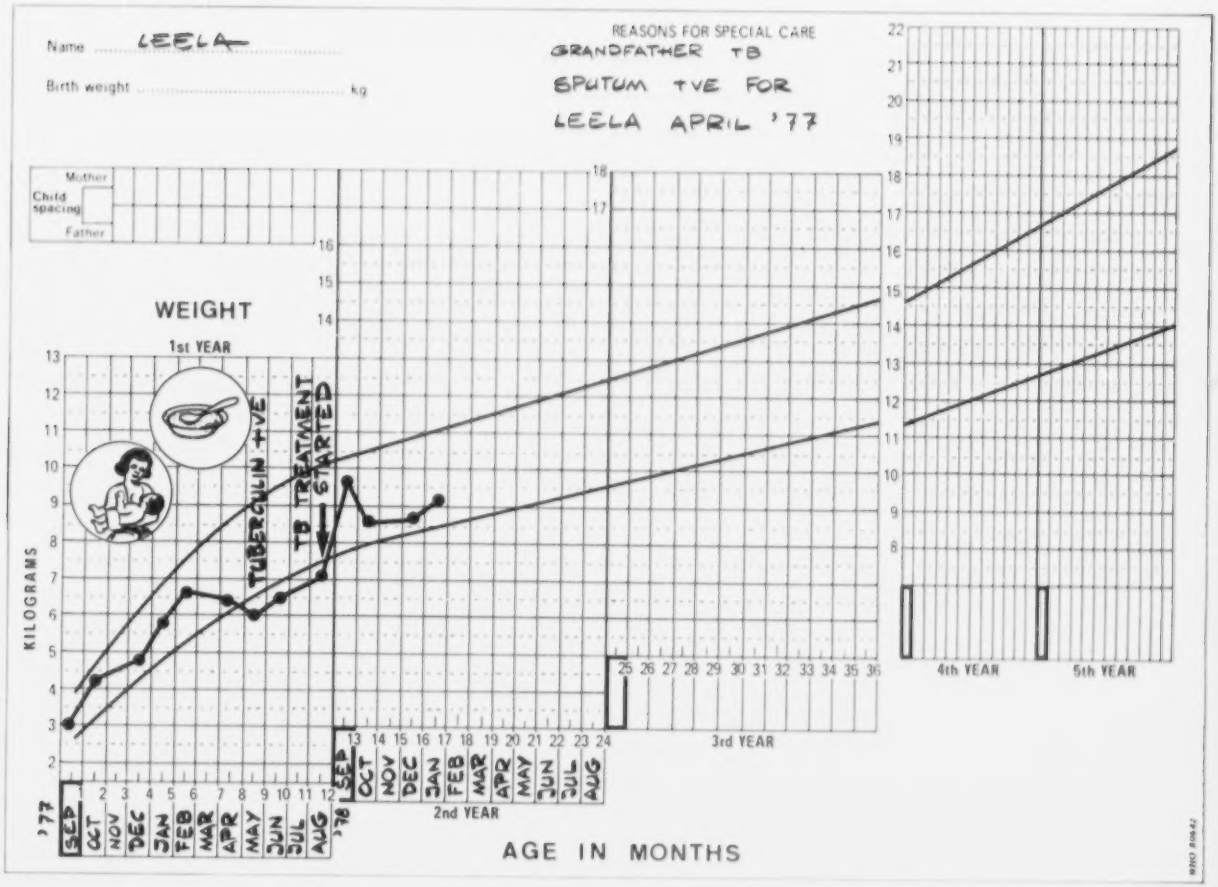


Fig. 21. Growth chart of Leela

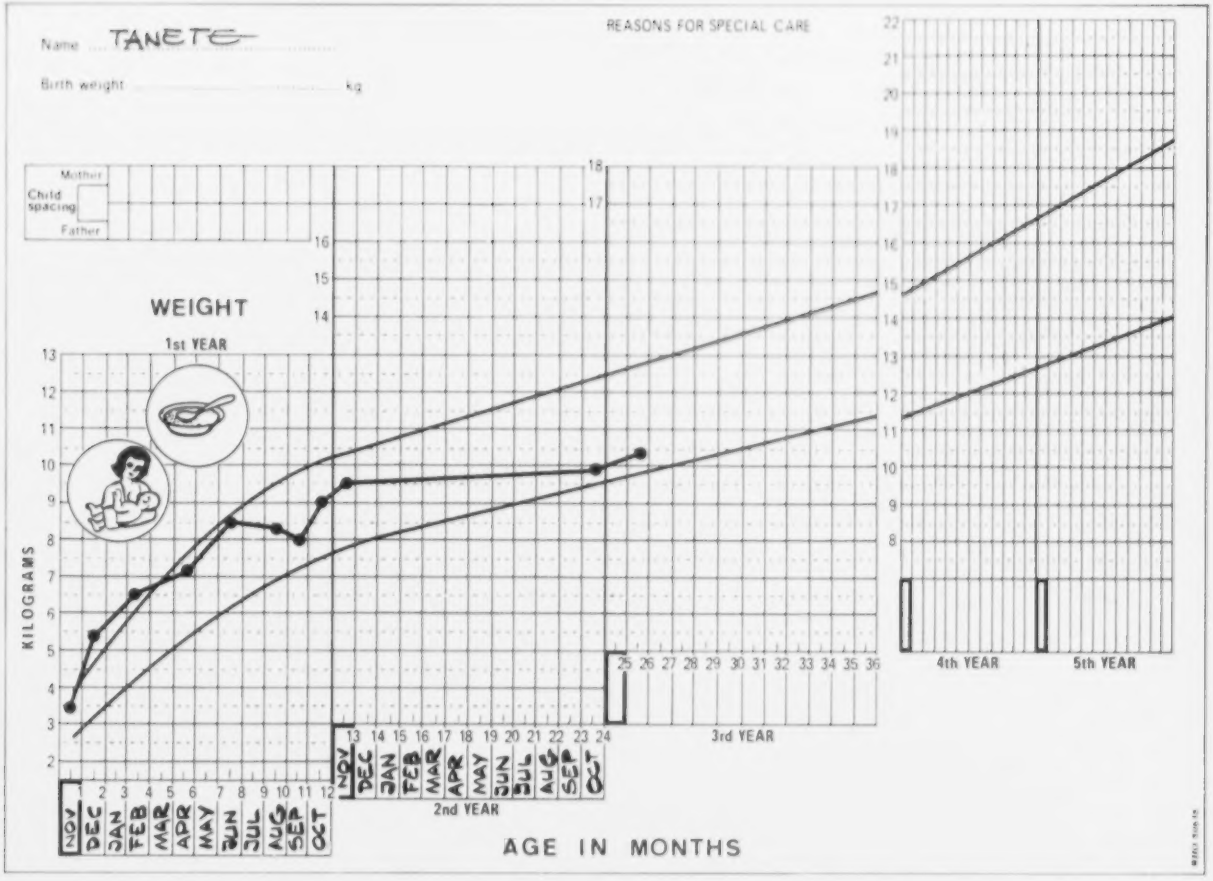


Fig. 22. Growth chart of Tanete

MODULE 3

PROMOTION OF BREAST-FEEDING

LEARNING OBJECTIVES

After studying this chapter, taking part in discussions, and doing the exercises, a community health worker should be able to:

- Find out all about breast-feeding practices in the community.
- Find out from individual mothers how they feed their children and what they think about breast-feeding.
- Encourage women to breast-feed their infants and teach them convincingly and sympathetically the advantages of breast-feeding.
- Reassure and help mothers to overcome problems of breast-feeding—flat or sore nipples, swollen (engorged), tender or painful breasts, and fear of too little milk or poor quality of milk.
- Explain to a mother the risk and cost of bottle feeding.
- Teach a mother how to prepare an artificial feed if her own milk is not available under any circumstances and explain to her the risks of artificial feeding and how to avoid them.

TRAINING CONTENT

Finding out how mothers feed their infants

It is important to know how mothers in the community feed their children. If an infant is properly fed during the first year, he or she will grow well and have a good start in life. Correct feeding and good growth in the first year mean that the risk of malnutrition in the second and third years is less. If a child is not fed well in the first year, it will be difficult to make up for this in later years. *Breast milk is the most important food in the first year* and *continues to be very valuable in the second year.* If we know how a child is fed, we can help him better.

One must be careful and gentle when finding out how mothers feed their children. Because feeding babies is a personal matter, one must first make friends with the mothers. Mothers should know that you want to learn about feeding practices so that you can help them.

One can find out about feeding practices by observing and questioning. Observing means watching carefully, trying to understand, and remembering. Questioning can be done in a simple way or in a systematic way with a list of questions. Both these methods are useful and for both, the questioner's approach should be friendly and sympathetic. Some observation and questioning was done when finding out about the community in Module 1. The community health worker should know answers to the following questions.

Some useful questions for finding out about infant feeding practices in the community.

- How soon after birth do mothers give the first breast-feed?
- What does the mother do with the colostrum—the watery milk-like fluid secreted from the breasts during the first 2-3 days after delivery?
- How are newborn babies fed for the first few days of life?
- Do all mothers in the community breast-feed their babies?

- For how many months does a mother breast-feed her baby in the community?
- How many times per day and night is breast milk given?
- What is the first other food or drink given to a baby? When and how is it given—by spoon, cup, bottle, or hand? At what age is it given?
- What feeding practices are forbidden (what are the food taboos)? (For example, in some areas breast-feeding during pregnancy is forbidden.) What foods should a mother not eat during lactation?
- Are there beliefs about certain foods or local herbs which are thought to increase the amount of milk produced by the mother?
- What food or drink is given to the baby when the mother goes out to work?
- Do any mothers have difficulties in breast-feeding their children? What are the problems? From whom do mothers seek advice about breast-feeding?
- If a mother is bottle-feeding her baby, why did she decide to feed the baby in that way? What mixture does she feed him?

Where breast-feeding is the normal practice in a community, little or no education is needed except for those with special problems. The traditional practice should be encouraged. In areas where traditional knowledge and practices are lost, especially in towns, education and personal support are needed. In many developing countries breast-feeding is usual in the first year of life. Recently, certain influences have been changing this important practice. These influences include the urban way of life, women working away from their homes to earn additional incomes, the advertising of infant foods, and the idea that bottle-feeding is modern and therefore somehow better. This is wrong. Community health workers should act to reduce the effect of these bad influences on breast-feeding.

Teaching about the advantages of breast-feeding

There are many advantages of breast-feeding. A community health worker must know and believe in these advantages. It is important that she and her relatives breast-feed their babies if they have any. If important and influential women in a community breast-feed their children, this will encourage others to do the same.

Breast milk is the best natural food for babies.

Breast milk contains the right mixture of fats, sugars, proteins, minerals, and most vitamins for a growing baby and is easy to digest. The nutrients in breast milk are essential for the growing body. It also contains substances which protect the child from infection. Cow's milk is the natural food for calves. Even if cow's milk is modified, it cannot have all the good qualities of human milk for a human baby.

Breast milk is suited to the growth needs of babies. Up to 4 months of age no other food is needed. Starting from 4–6 months other foods should also be given, but breast-feeding should continue. Even if a small quantity of mother's milk is available to the baby, it improves the quality of other foods the baby is taking from outside. *Breast-feeding is still important for growth in the second year of life.*

Breast milk is always clean.

Mother's milk passes straight from the breast into the infant's mouth. In that way it cannot be infected by germs. Many germs grow well in milk. Other milks, such as cow's milk, are easily contaminated with germs from dirty hands, spoons, cups, bottles, or flies. These milks should be boiled before being given to babies. The utensils used in feeding infants with other milks should also be boiled before every feed.

Breast milk contains protective substances against the germs that cause diarrhoea and some coughs and colds. Breast-fed children have fewer infections.

Breast milk protects the baby from disease.

With breast milk there is a special mechanism of demand and supply. The more often a baby sucks, the more milk the mother will produce.

Other types of milk need to be boiled before being fed to babies. They also need to be diluted with water when a baby is small. Any water used for dilution should also be boiled and cooled. Sugar should be added. If sugar is added to milk, it is preferable to boil the milk afterwards, as the sugar in most cases is not clean. The boiling requires fuel, and the mixing and cooling take time.

Breast milk is available 24 hours a day and requires no special preparation.

Most foods cost money, but mothers' milk is free. An infant who is 3 months old needs 600–700 ml of milk per day. If breast milk is not given, other milk must be purchased. In an ordinary home this will mean a large part of the family's income. There will be extra cost for fuel. (A mother should have extra food when she is breast-feeding, but this costs only about a quarter or less of the price of buying milk). Illnesses are more common when you use other types of milk. Treatment of the illnesses will cost both time and money. Why waste money and invite illness by bottle-feeding?

Breast milk does not cost anything.

Breast-feeding permits a closeness between a baby and mother. Every human sense is involved in breast-feeding. This contact includes touching, warmth, smell, looking, etc. If this close contact is started in the first few hours of life, the relationship is especially strong. Breast-feeding gives a feeling of security and love to the baby.

Breast-feeding makes a special relationship between mother and baby.

When a mother breast-feeds, her womb contracts. There are also other changes in the mother that result from breast-feeding. Mothers who breast-feed do not menstruate as soon after delivery as mothers who give artificial feeding. Mothers who breast-feed do not generally become pregnant again so soon. Breast-feeding therefore helps in spacing children. In this way a mother can give full attention to a small child for a longer time before the next child is born. Of course, breast-feeding is not a certain way of avoiding pregnancy. If parents want to be sure of not having another baby too soon, they should use some other contraceptive method in addition to breast-feeding. (A contraceptive is a method which prevents a woman becoming pregnant. Most contraceptive pills should *not* be used by a mother who is breast-feeding; they decrease the amount of milk she produces.) Regarding other contraceptive methods, the community health worker should consult her supervisor.

Breast-feeding helps parents to space their children.

Questions and practical points about how to breast-feed

Mothers in the countryside are the world's experts in breast-feeding. They learn from watching their own mothers, relations, and neighbours breast-feed their babies. They learn naturally and do not need special education. But mothers in urban areas, especially those with a first child, quite often need advice on specific matters.

The most important things the community health worker needs to know about breast-feeding are given below. These are in the form of answers to questions mothers may ask. Some mothers may be too shy to ask; nevertheless they need to know the answers to get the best results from breast-feeding.

When should mothers start breast-feeding?

A mother should put her baby to her breasts on the day he is born. It is best to start very early, within 1 or 2 hours of birth. There is little milk at that time, but it helps to establish feeding and a close relationship.

Should the first watery milk that comes before the regular milk be given to the baby?

This first milk is called *colostrum*. *Colostrum is very good for the baby.* It protects the baby from infectious diseases such as diarrhoea. The regular milk comes on the third to fifth day after the birth.

Can all mothers breast-feed their babies?

Yes, practically all. There are very few conditions in which a mother cannot feed her baby. Difficulties of breast-feeding will be discussed later.

How do you put the baby to the breast?

A mother normally knows this. Only teach her if she is having difficulty.

The mother should be comfortable. After delivery, sitting up may be painful. The mother or baby can be supported by pillows, or she may feed the baby while lying down on her side with the baby beside her.

If she touches the baby's cheek with her nipple, the baby will automatically turn his head and open his mouth. Not only the nipple, but also the areola (the dark skin around the nipple) should be in the baby's mouth. The baby's chin should be pressed up against the

breast. If the breast is very full, it may press against the baby's nose and make it difficult for him to breathe. To avoid this the mother should lean towards the baby; she can also gently hold the breast away from the baby's nose with her fingers.

The baby should suck from both breasts at each feed. Feeding should start with the right breast on one occasion, and the left breast on another.

If the mother can relax, the milk will flow easily and she and the baby will enjoy the closeness and satisfaction of breast-feeding.

How often should the mother breast-feed?

The more often the baby sucks, the more breast milk will be produced by the mother. Allow the baby to breast-feed whenever he wants. During the first few days the baby will cry when he wants milk; mother and baby usually settle into a rhythm. It is *not* a good thing to feed at a precise time according to a clock.

How long should a baby be fed each time?

The baby should be allowed to suck for as long as he wants. At first the time may be quite short, 5–10 minutes from each side. When the baby gets older and stronger he will suck for a longer time because he needs more milk.

Should the baby be fed at night?

Small babies need to be fed at night. In the first few weeks of life most babies wake up with hunger in the night. They need extra feeding. In many countries babies sleep next to their mothers. There is no danger of a mother crushing her child. Babies enjoy the warmth and closeness of the mother's body. Many babies feed in the night, sometimes without waking the mother.

Up to what age should a child be breast-fed?

A baby should breast-feed for as long as possible. It is good to breast-feed for at least one year. Breast milk is still important for growth in the second year of life because even a small quantity of breast milk along with other foods can improve the diet of a two-year old child.

How do you know if the baby is getting enough breast milk?

Most mothers produce enough milk for a baby to grow well for the first 4–6 months of life. Growth should be measured by weighing the baby regularly (see Module 2).

How quickly should breast-feeding be stopped?

If a mother wants to stop breast-feeding, she should do it gradually. Stopping breast-feeding should not be sudden because the baby will need some time to get used to other foods. Other foods should first be introduced and increased over a period of 2–3 months. Then the baby will suck less, and less milk will be produced.

Should breast-feeding be stopped if the mother becomes pregnant?

It is not necessary to stop breast-feeding when a mother becomes pregnant. The quality of her milk will still be good, but the quantity may decrease.

Breast-feeding for the first few months of pregnancy will cause no harm to the child in her womb. *A pregnant mother who is also breast-feeding will need extra food.*

It is not good for a mother to become pregnant soon after she has had a baby. She will not be able to give the first child breast milk long enough.

What can a working mother do about feeding her baby when she is away at work?

If she is going to be away for a short time, she should feed the baby just before she leaves. If she has to be away for a long time, she should try and take the baby with her. The baby can be fed anywhere. Some countries have laws to ensure that working mothers have prolonged maternity leave and time during working hours to breast-feed babies. If she must leave the baby she should make good arrangements. Another mother may give the baby a breast-feed. If the baby can take other foods, something should be carefully prepared and preserved for him. A responsible person should be shown how to feed this food to the baby when the mother is away. (Suitable foods will be discussed in Module 4.)

Should the baby be given occasional feeds from a bottle?

NO. A small baby does not need extra feeds from a bottle. If the baby cries, he should be put to the breast more often. Mother's milk provides all that a young baby needs. Boiled water may be given if a baby has diarrhoea or fever, but *breast-feeding should continue.* The

boiled water can be given with a spoon or a special feeding cup. Bottles are often dirty, difficult to clean, and can be dangerous. Older children can drink from a cup.

Can contraceptive pills be taken while breast-feeding?

Some contraceptive pills reduce the amount of breast milk. *Breast-feeding mothers should use pills which do not affect milk production or preferably use other methods of avoiding pregnancy during the period of breast-feeding.* This is important because a baby should receive breast milk for as long as possible.

Overcoming problems of breast-feeding

There are a few common problems with breast-feeding, especially in the first one or two weeks. The most frequent are a mother's anxieties about her performance, and the amount and quality of her milk. Others include flat nipples, sore nipples, and very swollen and tender breasts.

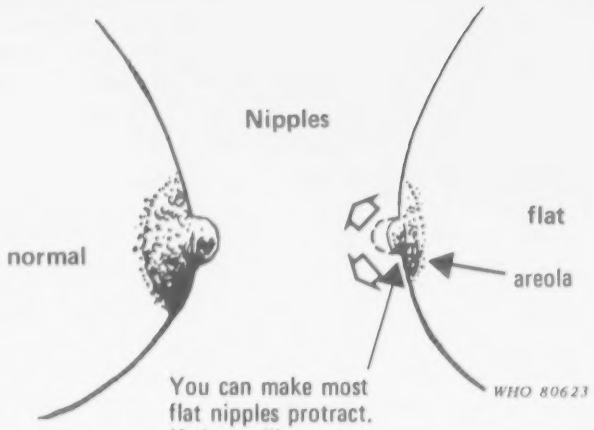
Preparation for breast-feeding during pregnancy can avoid a number of these problems. The community health worker should contact every mother during pregnancy and discuss breast-feeding. The mother should be taught to pull out the nipples, gently press out a few drops of fluid, and build up her confidence in the ability to feed successfully. This is particularly important because, for various reasons, the flow of milk during the first week of pregnancy may not be good. The community health worker should visit the mother soon after delivery and give encouragement, support, and comforting answers to the mother's questions.

Flat nipples

Some women have short, flat nipples. Flat nipples are most common in women who are having their first child (Fig. 23). Most nipples are protractile (you can pull them out) and quite long. If a nipple is not protractile, the baby will have difficulty in feeding.

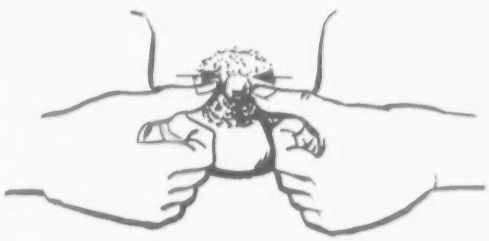
Examine the breasts of every pregnant woman. If the nipples are flat, see if they will protract. Teach her to squeeze her nipples and pull them gently (Fig. 24). She should do this for several minutes every day. Her nipples will grow longer.

After the baby is born, nipples can still be stretched further. The mother should squeeze the areola before putting the nipple in the



You can make most flat nipples protract. If they will protract a baby can suck normally

Fig. 23. A flat nipple



If a mother squeezes her nipples like this several times each day during pregnancy, they will get longer and her baby can suck more easily

Fig. 24. Preventing flat nipples

baby's mouth. If the breast is very full, first express some milk before doing this.

Swollen (engorged) breasts

Sometimes a mother's breasts make more milk than her baby needs. This is quite common in the first week after the baby is born. Sometimes the baby is too weak to suck all the milk. If a breast is not emptied normally, it becomes painful and swollen with milk (it becomes engorged). The skin is tight and the baby cannot put the whole areola in his mouth to suck. Sucking may be very painful to the mother. Prevent and treat engorged breasts by emptying them regularly.

Expressing breast milk. Teach a mother to express her milk when her breasts feel painfully full (Fig. 25). She should wash her hands and find a clean cup or bowl. Using both hands squeeze gently from the base of the breast towards the nipple. Then squeeze the breast and areola between fingers and thumb and let the milk squirt into the cup. Milk must be expressed from each part of the breast. You cannot express a breast quickly. An empty breast should be soft without any lumps. If an engorged breast is not emptied, the amount of milk produced by it will decrease quickly. The expressed milk can be fed to the baby in a number of ways (Fig. 26).

A tender lump in the first week of breastfeeding may be caused by a blocked milk duct in the breast. Empty the breast and then gently press and empty the lump. This will prevent serious problems later.

Sore nipples

Nipples are very sensitive. If the skin is very soft and the baby sucks very hard, soreness develops. This happens more in women with engorged breasts and in women with small or flat nipples because the baby has to suck extra hard to hold the nipple in his mouth. Sometimes the soreness develops into a crack which is very painful. A crack is not usually due to a baby biting the nipple. Infection can get into the breast through a crack in the skin.

To prevent sore nipples keep the skin soft by rubbing the areola and nipple with some oil. Do not let the baby suck for too long at first. Change the position so that when the baby sucks the line of pressure will not always be at the same place. Make sure the breasts are emptied regularly, by expressing them if necessary. Let the nipples dry in the air after feeds.

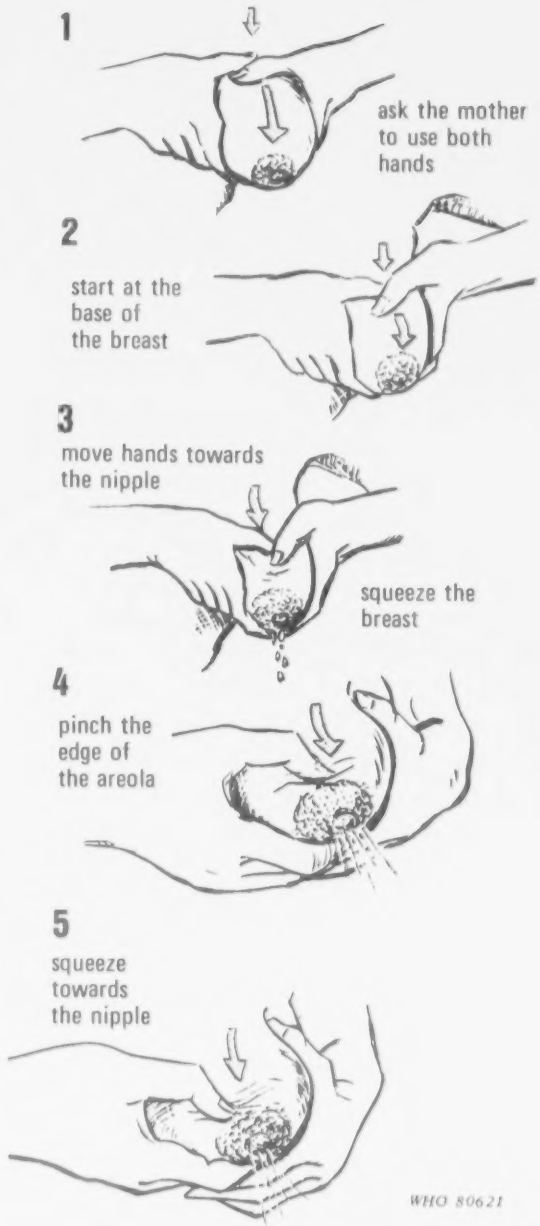


Fig. 25. Expressing breast milk

Treat sore nipples by keeping the breasts empty. Sucking is usually too painful, and it will be necessary to express the milk. Put some antiseptic ointment or antibiotic (tetracycline ointment) on the crack. Let the child feed from the other breast. If necessary, give the mother aspirin or paracetamol tablets to relieve the pain.

Fig. 26. Four ways of feeding a baby

Painful tender breasts with fever

Sometimes germs enter the breasts, perhaps through a crack in the nipple. This causes infections. A part of the breast becomes painful, swollen, red and warm. The woman may have fever.

Antibiotics are needed and the mother should be referred to the health centre or hospital. In this case also it is important to keep the breast empty of milk by feeding or expressing. The breast will be very painful, but the baby should go on sucking. Breast-feeding should be stopped only if there is pus coming out from the nipple. Give the mother aspirin or paracetamol tablets to relieve the pain and fever.

Fears that there is too little milk or that it is of poor quality

In the beginning, it is common for mothers to worry that they do not have enough milk for their babies. Breasts begin secreting milk from the third to the fifth day after delivery. However, during the first 2 or 3 days after delivery, breasts secrete enough colostrum to feed the baby. Encourage the mothers by telling them:

- Milk usually starts to flow on the third to fifth day, but breast-feeding should be started immediately so that the baby can get the colostrum. Immediate breast-feeding will promote early milk secretion.
- A baby is born with plenty of water in his body and does not need to drink much in the first few days.
- The baby should be put to the breast regularly. He will get some colostrum which is good, and sucking helps the milk to come.

Often mothers of 2–6 month-old babies worry that the baby is not getting enough milk, especially if the baby cries a lot. Help the mother in the following ways:

- Weigh the baby regularly. If there is steady weight gain, reassure the mother (see Module 2).
- The baby may cry for reasons other than hunger. Make sure he is not wet, cold, or uncomfortable. Crying after feeds is not usually due to hunger.
- If the baby is not gaining weight well, try first to increase the mother's milk. She should have more food, drink, and rest. Where culturally appropriate, give locally accepted herbs and drinks to increase breast milk. The baby should be put to the breast more often to feed. Help the mother to overcome any other anxieties, because anxiety can decrease her milk flow.

- Even if a mother has only a little breast milk, she must continue breast-feeding her child. Whatever breast milk she has is good, and she may have more later if she perseveres.

Mothers sometimes worry that their milk is not suiting the baby, or that it is of poor quality. Ignorant women and grandmothers sometimes say such things. In fact a mother's milk is just right for her baby. It contains nourishment and substances that provide protection from infections. Strong reassurance should be given because if a woman loses confidence, her milk supply may decrease.

How to feed a baby if the mother has no milk: the dangers of bottle-feeding

If the mother of a small baby has no breast milk, or if the mother has died in childbirth, efforts should be made to find someone else who can breast-feed the child. A friend or relation may act as a wet-nurse. A wet-nurse is some woman other than the mother who breast-feeds a baby. Even if a woman is not lactating and does not have a small baby she may be able to breast-feed again. She must desire or feel it her duty to breast-feed the baby. The baby must be put to both her breasts frequently. She should also have extra food and drink. If there are local herbs believed to increase breast milk, she should use these. This process is called *relactation*. Relactation does not work with all women.

If the mother really cannot make her breast milk and a wet-nurse cannot be found, then it will be necessary to give the child artificial feeding, with milk from a cow or other animal or with powdered milk. The common practice of bottle-feeding is dangerous. Here are some of the reasons:

- Milk is easily contaminated with germs from dirty bottles, rubber teats, spoons, water, or hands. This danger is greatest in homes where there is no running water supply and where there is little fuel or time for sterilizing the feeding-bottles and teats.
- Except for breast milk, no other milk has any substances that can protect the child from infections.
- Milk goes bad if it is not used quickly. This happens much more quickly in hot climates.
- Cow's milk and powdered milks are often diluted too much. This is because they cost so much. If they are diluted the children do not get adequate nourishment and will not grow.
- The rubber teat of the bottle may have too small or too large a hole. If the hole is too small the child may struggle to get the milk and swallow a lot of air but not enough milk. Too large a hole may cause rapid feeding and sometimes vomiting.

Here are some things that can be done to make artificial feeding less dangerous:

What a mother can do:

- Wash hands with soap and water every time before preparing the feed.
- Use other methods of feeding rather than a bottle. Feed with a cup and spoon (Fig. 27) or a special feeding spoon.
- Wash and then boil these utensils before use. They are all much easier to clean than a bottle.
- If the milk has to be diluted or prepared (as in the case of powdered milk), use boiled water.
- Mix up only the amount needed for one feed. If too much is mixed and some of it is stored for a later feed, the danger of contamination is great.

Fig. 27. Cup and spoon feeding is safer than bottle-feeding

What the community health worker can do:

- Find out if the family can afford to buy the milk. If the family is poor and cannot get free milk from the health service, the baby will need milk and porridge to give him enough nourishment.
- Only teach about artificial feeding to mothers who have no chance of breast-feeding. *Do not teach about artificial feeding to a group of mothers.*
- Teach the mother that artificial feeds must not be used to supplement breast milk. It will only reduce the production of breast milk. (Note that artificial feeding may be used to supplement breast-feeding if the growth chart of a child shows that he is not gaining weight.)

If *cow's*, or *goat's*, or *camel's milk* is used for artificial feeding:

- During the first 15 days of life: Give 1 part of boiled and cooled milk diluted with 1 equal part of boiled and cooled water.
- From 2 weeks to 4 months of age: Give 2 parts of boiled and cooled milk diluted with 1 part of boiled and cooled water.
- After 4 months of age: Give *undiluted* boiled and cooled milk.

(If *buffalo's milk* is used instead, the cream must be removed before the milk is boiled, since buffalo's milk contains too much fat for babies. After the cream has been taken off, follow the same instructions as for cow's milk.)

How much milk does a baby need?

An artificially fed baby needs about 150 millilitres of milk for each kilogram of his own weight each day. If pounds and ounces are used in weighing and measuring, the rule is to give $2\frac{1}{2}$ ounces of milk per pound of body weight of the baby. One kilogram is 2.2 pounds and about 30 millilitres is one ounce. So a very young baby weighing 3 kg will need 450 ml of milk a day. He needs feeding about 6–8 times a day; therefore he will need about 55–75 ml of diluted milk at each feed. Feed older babies 5 times a day. A 5-month old baby weighing 7 kg will need a little more than 1 litre of undiluted milk a day; about 210 ml at each feed.

SOME IMPORTANT THINGS TO TEACH ABOUT ARTIFICIAL FEEDING

- Breast-feeding is the best feeding until a child is 18–24 months old, but additional foods should be given when the child reaches 4–6 months of age.
- Mixing and preparing powdered milk is very complicated. Anyone who needs to use powdered milk should have a demonstration from a trained person.
- It is very expensive to feed a baby with the correct amounts of powdered milk.

TRAINING METHODS

1. *Lecture*: Training content.
2. *Demonstration*: Preparation of an artificial feed.
3. *Community survey*: Finding out infant feeding practices in the community, and problems of breast-feeding.
4. *Group discussion*: Results of the community survey.

EXERCISES

These can be done by the trainees in groups, pairs, or individually.

Exercise 1. Finding out about the infant feeding practices in the community

Using the questions on pages 59–60 of this module, ask each trainee to interview five mothers with infants and put together the collected information. This will give a picture of the infant and show what existing practices need to be corrected and how.

Exercise 2. Estimating the cost of bottle feeding

List and find out the prices of all the items needed to feed a 3-month old baby with powdered milk (tin of milk, bottle, teat, equipment for cleaning and boiling the bottle, fuel for boiling water, etc.). Calculate how much it costs to feed a 3-month old baby with the correct amount of milk for a day. Compare this cost with:

(*a*) the daily wage of an agricultural labourer in the area, and
(*b*) the cost of giving a mother 25% extra food per day (she needs this to help her make breast milk).

Exercise 3. Comparing the time taken to breast-feed and bottle-feed a child

Most village mothers have very little time to spare. They are busy with their household work and other jobs to earn money or grow food. Mothers often start work long before dawn and cannot rest until they go to bed at night. Find out how much time it takes to feed a child by bottle by doing the following exercise.

Calculate the time it takes to do all the activities necessary for artificial feeding (i.e., buying milk, fetching water, collecting fuel, boiling water, cleaning and sterilizing bottle, measuring and mixing milk, filling the bottle and feeding the baby). Bottle-feeding has to be done about 5 times a day. Calculate the time it takes to breast-feed a baby. Now compare the total time required each day to bottle-feed a baby with the time required to breast-feed him.

Exercise 4. Finding out reasons for stopping breast-feeding

Find 10–15 mothers in the area who are using milks other than breast milk for feeding their babies. Ask them the reasons why they stopped breast-feeding. Discuss the reasons they give. Are these the only reasons, or are there other factors which mothers did not want to tell you about? How can we decrease the influences which lead to artificial feeding?

Exercise 5. Comparing the growth and health of children fed on breast milk and other milks

Select two groups of children under 1 year of age from the local community. The first group should comprise breast-fed babies and the other babies fed on other milks. Look at their growth charts and clinical records. Compare and discuss the weight gains and number of illnesses in the two groups.

Exercise 6. Finding out how baby foods are advertised

Find out the different ways in which companies making baby food and milk advertise their products (e.g., radio, magazines, posters, free samples, etc.). Discuss the effect of this advertising and what should be done to decrease its influence.

Exercise 7. Finding out how mothers overcome difficulties of breast-feeding

Interview mothers who are experienced at breast-feeding. Ask them about any difficulties they might have had when they started breast-feeding and how they overcame these problems (e.g., sore nipples and engorged breasts).

MODULE 4

NUTRITIONAL ADVICE ON THE FEEDING OF INFANTS AND YOUNG CHILDREN

LEARNING OBJECTIVES

After studying this chapter, taking part in the discussions and doing the exercises, a community health worker should be able to:

- Find out how mothers feed their young children and what are their beliefs about various foods.
- Find out what foods available in the area are suitable for feeding to children.
- Find out how the availability and prices of foods vary with different seasons.
- Prepare and mix local foods so they can be suitable for giving to young children.
- Prepare an appropriate diet for young children, and know when, how often, and how much they should eat.
- Give feeding advice convincingly to parents.

TRAINING CONTENT

Finding out how mothers feed young children and what are their beliefs about various foods

In most tropical and developing countries mothers breast-feed their babies. Breast milk is an excellent food and this feeding should be encouraged. However, *after 4–5 months, breast milk alone is not enough to make an infant grow well.* Other foods are also needed. To help mothers feed their babies, it is important to know first what foods mothers in the area give their young children, and what are their beliefs about these foods. Most feeding practices are part of the customs and traditions in any community. They are passed down from one generation to the next. Religious beliefs influence feeding practices. Feeding practices may also vary among different social groups, castes, etc.

When finding out about children's diets one should be sensitive about the mothers' feelings. Read again the comments at the beginning of Module 3. A friendly and sympathetic manner is important when asking questions or observing. Information should be collected systematically. Questionnaires may be useful.

Information about feeding of young children

A community health worker needs to know the answers to the following questions:

- At what age is the first food other than breast milk given to children?
- What are these foods?
- How are the foods for young children prepared?
- Are there ceremonial, religious, or other reasons for giving these foods to children?
- How many times per day and in what amounts are children given food at different ages?
- What foods are generally forbidden for children, and why?
- Is there a communal dish from which young children must compete for food? How much food does a young child actually get? (Observe the family group at meals.)

Local foods suitable for young children

Find out which foods are grown in the area and which others are available in shops and markets. What are the prices of these foods? Many foods are seasonal. At certain times of the year it may not be possible to grow or buy certain things. The prices will go up and down because of variations in climate, availability, and demand. It will be useful to make lists of the foods available and of their prices at different seasons, e.g., lists of foods that are the cheapest source of energy, animal protein, iron, or vitamin A, and so on, in a particular region, village, or community.

Some foods are better than others for the growth and health of young children. As they grow older, children need mixtures of foods. The most important groups of food in most communities are listed below.

Important groups of foods in most communities

- *Cereal grains*: wheat, rice, maize, millet, etc.
- *Legumes or pulses*: peas, beans, and lentils.
- *Leafy green or coloured vegetables or fruits*: spinach, carrots, tomatoes, pumpkin, papaya, mangoes.
- *Foods from animals*: meat, eggs, fish, and milk.
- *Oils and sugar*: vegetable oils, animal fats, sugar, molasses.

Cereals are the largest part of the diet in most areas. In some places where cereals are not easily available, people eat cassava, potatoes, or plantain. These foods are not as good as cereals for growing children. *Cereals and legumes cooked properly make an excellent food combination for infants.*

All young children should gradually be given food from the first three groups listed above. If it is culturally acceptable, and if parents can afford it, small amounts of the animal foods can also be given, though these are not essential. *Some oil added to food or cooked with it is especially useful because it gives much energy and also makes food soft and tasty.* Remember to have as many varieties of food in the diet as possible. This increases the nutritional value of the diet.

Preparing and mixing local foods for children

Before preparing food, before eating it, and before feeding children, the hands should be washed with soap and water. Germs that cannot be seen on dirty hands can be passed on to the food. These germs will be eaten with the food and may cause diarrhoea and other illnesses. *Cooking kills most germs.* After cooking, handle food as little as possible and keep it in a covered container.

Food for infants up to 6 months of age

A baby has no teeth and since he is only used to breast milk, the first foods given to him should be soft and should not have a strong spicy flavour (e.g., curry). If a certain cereal is the staple diet of the community, it should be used to make the first food for an infant. Corn and rice starch powders, sold in markets in many countries, should not be used for this purpose. The cereal should be well cooked and mashed so that it is soft. Cereal or cereal flour can be made into porridge or made very soft by adding water. In the beginning this porridge may be very thin, but as the child grows older, the porridge should be made thicker. If much water is added, the porridge will not provide much energy to the child. A thick porridge is more nourishing than a thin watery gruel.

If the cereal is cooked in oil, or if oil is added, it will increase the amount of energy the food can provide. Sugar, either white or brown, will also increase the energy in the food, but it is not as good as oil. Sweet foods are bad for the teeth.

Food for children 6 months to 1 year old

In the second half of the first year of life a child can take a more varied diet. Once a child is eating the cereal porridge well, cooked leguminous and other vegetables can be mixed with cereal or given separately. New items should be added to the diet one at a time. Only small amounts should be given at first. Gradually increase the quantity but do not force the child to eat more than he accepts. The vegetables should be very soft, without fibre, and mashed.

If a family eats animal foods and can afford to buy them, these can also be given. Meat or fish should be minced or finely chopped. A lightly boiled egg can be mixed with the porridge or given by itself. Milk from animals should be boiled before it is given to children. Curd is an acceptable food for children in many cultures. None of these animal foods is essential for growth and health so long as adequate amounts and mixtures of vegetable foods are given. After introducing a new food,

it is good to wait for a few days before introducing another food.

Food after the first year

After the first year, a child is usually able to eat the food prepared for the family. ***In other words, he starts sharing the family diet.*** It is good to separate a little food on to a separate plate for a young child; care should be taken to include at least three kinds of food. In that way it is possible to see how much the child is given and how much he eats. During cooking, it may be necessary to remove a portion for a young child before adding strong spices.

The stools of a child will change when he starts eating a mixed diet. The mother should be warned about this. A healthy breast-fed child has soft yellow stools. When a child eats other foods the colour, smell, and shape of stools will change. Stools will become more like adult stools. Some mothers who breast-feed may say that their babies have diarrhoea, when actually the stools are normal—soft in consistency. It is better to demonstrate to them the difference between a breast-fed baby's soft stools and the adult type of stools of babies fed on other foods (including formula milk).

Feeding young children: how, when, and how often

To feed a young baby a mother should have patience and simple knowledge about the foods that are available and can help her baby grow to be healthy and well. Most mothers have the love and patience, but they may need to learn how to use available foods for their babies.

At what age should food (other than breast milk) first be given to an infant?

Start solid food at about 4 or 5 months of age. Until then breast milk of most mothers supplies all the nourishment a young child needs.

> When the baby is 4–6 months old, breast milk alone is not sufficient—start solid foods.

How many times a day should a young child be fed?

At first, when the baby is still being breast-fed, give cereal porridge, 1–2 small spoonfuls twice a day. The amount of food and the number of feeds per day should be increased gradually. By 6–9 months of age a child should be fed 3–4 times a day in addition to breast-feeds.

How should the meals be timed in relation to the breast-feeds?

At first, when a child is learning to take new foods, give the food when the child is hungry before breast-feeds. When the child is taking the porridge or mixtures well, give the breast-feed first, or between other meals. In this way the baby will suck the breast hard because he will be hungry. This will encourage a continued supply of breast milk. Remember, breast-feeding should continue for 2 full years if possible (see Module 3).

How much food should a child take at one meal?

If he is just starting to eat, or if a new food is being introduced, 2 small spoonfuls may be enough. Once he is used to the new food and flavour, he should be given at least 3 large spoonfuls (tablespoons) of food for each meal. If he can take more, more should be given. If he is unwilling to take this amount it may be necessary to divide the amount into 2 smaller meals. If this is done, the amount kept for the second small meal should be carefully protected from flies and dust in a covered container. It should be kept in as cool a place as possible for not more than 4 hours.

> By the time the child is 1 year old, he or she should be sharing the family diet, with four or five varieties of food.

Feeding small children should be a priority within the family

Feed the young child first because he eats slowly and cannot compete with older children and adults for the limited amount of food prepared for a meal. Feed the girls as much and as frequently as the boys. By the time a child is 2 years old he or she should eat half as much as an adult. It is good for a small child to have his own plate and portion of food. When a child is ill, he still needs nourishment. He may lose his appetite and often refuses to eat, but he needs strength to get better from the illness. Time and care must be taken to help an ill child eat enough food. Even if small amounts of foods are eaten, this will help, if such feeding is repeated as often as possible.

A time-chart for the feeding of children

The chart shown in Fig. 28 gives you an idea of how to feed children from birth up to 2 years of age. It need not be followed too rigidly.

Teaching and convincing mothers about correct feeding

In order to teach effectively, a community health worker must not only know about the correct methods of infant feeding, she must also really believe in them. A friendly relationship with people is important in teaching about feeding. Some mothers may feel insulted or threatened if another person starts teaching them about feeding their children. Make friends with mothers before teaching them. Show a loving concern for mothers and their families in other ways also. The best way to learn is from a friend.

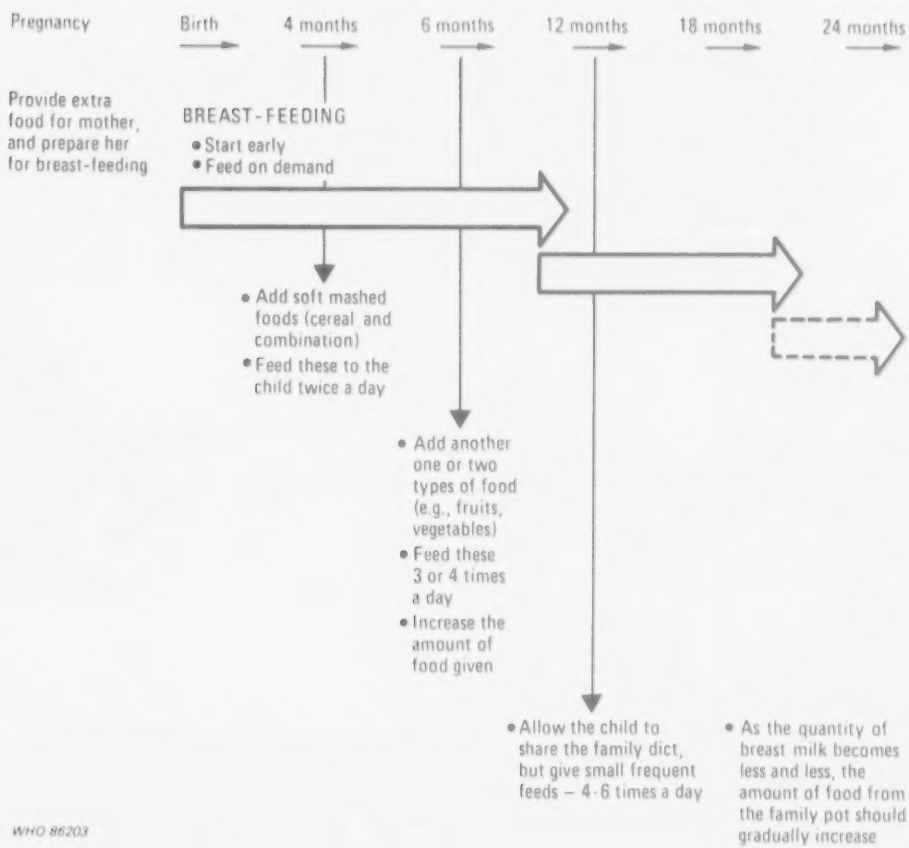

Pregnancy
Birth
4 months
6 months
12 months
18 months
24 months
Provide extra food for mother, and prepare her for breast-feeding
BREAST-FEEDING
• Start early
• Feed on demand
• Add soft mashed foods (cereal and combination)
• Feed these to the child twice a day
• Add another one or two types of food (e.g., fruits, vegetables)
• Feed these 3 or 4 times a day
• Increase the amount of food given
• Allow the child to share the family dict, but give small frequent feeds – 4-6 times a day
• As the quantity of breast milk becomes less and less, the amount of food from the family pot should gradually increase
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Fig. 28. A time-chart for the feeding of children

Once some women have learnt about feeding and start to feed their children in the way you have taught them, others will copy the same methods when they see children growing up healthily. The messages about successful feeding can thus spread within the community. Some mothers are good teachers.

How do you know if a child is getting enough food?

Weigh him regularly and plot the weights on a growth chart (Module 2). With sufficient food of good quality, the child's weight will continue to increase within the two reference lines on the growth chart. The use of the growth chart can be a very useful way of teaching the mother to find out for herself whether she is feeding her child properly.

TRAINING METHODS

1. *Lecture*: Training content.
2. *Practical work and demonstration*: Preparing a meal for a small child.
3. *Community survey*: Observing diets and feeding problems of small children.
4. *Group discussion*: Results of the community survey.

EXERCISES

Exercise 1. Observing a child's diet

Ask trainees to make friends with mothers who have babies between the ages of 12 and 18 months. These mothers should not be from wealthy families. The trainees should ask their permission to "observe" the babies for a whole day. The trainees should base their observations on the questions given below:

- How many times is the child put to the breast?
- How many other feeds are given during the day?
- What foods are given?
- How much food is given each time?
- Who gives the food?
- How are hands and utensils cleaned before feeding the child?
- How are the foods prepared and stored?

On the next day ask the trainees to discuss what they observed. After the discussion, they will have a better understanding of feeding practices and problems in that area. They will be able to plan how to help and teach mothers more effectively.

Exercise 2. Preparing food for small children

In this exercise the trainees work together to prepare a meal for about 10 children between the ages of 6 and 9 months. At least two types of food should be used.

The trainees should first plan the meal and then go and buy the necessary materials. They should be given some money for this purpose. The meal should be prepared in an ordinary home in the community. The trainees should invite about 10 mothers with children between the ages of 6 and 9 months. Once the meal is ready the trainees should help the mothers to feed the babies. After the meal they should have a discussion with the mothers on the cost of food, method of preparation, suitability of the food, and difficulties in feeding young children.

This exercise should be repeated for children between the ages of 1 and $1\frac{1}{2}$ years of age. This exercise provides a teaching and learning situation both for the trainees and for the mothers. If the class is too large, the trainees can be divided into two or more groups.

Exercise 3. Feeding problems

The trainees can ask the mothers of small children what difficulties they nave had in feeding children. They can find out why mothers ask for the help of older women in the community when they have feeding problems. These "advisers" can be asked about their advice. Later the trainees can meet together and discuss what they learnt from the older women. This will help them to understand and teach mothers more effectively about feeding problems.

Exercise 4. Storing food

Mothers are very busy people. They only have time to cook food once or twice a day. Small children need to eat 4–6 times a day. It is important to be able to store food safely for short periods. In tropical countries, if food is not prepared cleanly and stored safely, it will soon spoil. Dirty or spoilt food can cause diseases such as diarrhoea.

The trainees should find out how food is stored in homes. They should discuss together and with their supervisors if these methods are safe. They should consider how storing of food can be improved using only the utensils found in ordinary homes. The most important points to remember are to keep the food cool and properly covered so that flies and dust cannot reach it. Hands should be washed properly before handling food.

MODULE 5

NUTRITIONAL CARE OF MOTHERS

LEARNING OBJECTIVES

After studying this chapter, taking part in the discussions, and doing the exercises, a community health worker should be able to:

- Collect information on the local beliefs and practices about different foods and feeding during pregnancy and lactation.
- Explain to mothers-to-be and mothers the importance of a proper diet during pregnancy and lactation.
- Advise mothers on suitable diets during pregnancy and lactation.
- Detect which mothers in the community are at risk of malnutrition during pregnancy and lactation, and take appropriate action.
- Detect anaemia by examining the inner side of lips and eyelids, and take appropriate action.

TRAINING CONTENT

Beliefs and practices about foods in pregnancy and lactation

Pregnancy is the time when the baby is being formed inside the body of the mother. The unborn child is completely dependent on the health and wellbeing of the mother. If a mother has some disease, the baby may be affected. If a mother does not have enough food during pregnancy, the baby may be small and weak. Small babies are small because they are malnourished.

There are many beliefs and practices about pregnancy in different cultures. Some of these concern the relationship between what the mother eats and how the child will develop. The eating of certain foods is believed to affect characteristics of the child: brave or cowardly, beautiful or ugly, generous or selfish, etc. There is no scientific evidence for these beliefs. However, in order to be able to advise mothers, it is important to understand the beliefs of mothers about various foods.

In many countries mothers believe that if they eat too much the baby will grow too big. They think that the big baby will cause a long, painful and difficult delivery. This is not true and it is a harmful belief. Even if mothers eat a lot, the baby will not grow larger than a certain size. If a mother eats well, both she and her baby will be strong and healthy at the time of delivery.

There are also special beliefs and practices about diet and breast milk in different cultures. If a mother eats certain foods it is believed that her milk may be spoilt or unsuitable for her child. Other foods are believed to increase the flow of milk.

The community health worker needs to know about all the beliefs and practices concerning food. Inquiries should be made from grandmothers and older women in the community. Customs that favour better nutrition should be encouraged and promoted when teaching about appropriate diets. Customs that are bad have to be tactfully discouraged.

Nutrition and health during pregnancy and lactation

A woman remains pregnant for about 280 days. During this time a tiny fertilized cell grows into a fully-formed, 3-kilogram baby inside the mother's womb. The raw materials required for this growth come from the

mother's diet. Therefore, during the pregnancy the mother needs much extra food so that the baby becomes strong and healthy. The mother's diet should include all the nutrients needed for the baby to grow well. This means that a mother needs not only extra food, but also certain types of food. These will be discussed in the section entitled 'A good diet for pregnancy and lactation' below.

Mothers who do not have enough food during pregnancy have smaller babies. Such babies have a low birth-weight. They may weigh less than 2500 grams (2.5 kg) and if so are already malnourished. There are more illnesses and deaths among small babies than among larger, normal-sized babies. Low-birth-weight babies are especially at risk of becoming more malnourished. Therefore, it is important for pregnant women to have enough food.

If a mother has a good diet with enough energy-giving foods during pregnancy, she becomes heavier and puts on fat. Her abdomen enlarges because her womb becomes bigger with the growing baby inside. Her breasts enlarge and get ready to produce milk. She collects a layer of fat under the skin. This is important because it is this stored fat that is used to make much of the milk in the months when she is breast-feeding. If she does not have enough food when she is pregnant, she will not store enough fat, and if she does not have enough fat she will not produce enough milk. This is particularly important for women who are initially small.

The diet of a woman when she is breast-feeding her child is also important. The food a mother eats is partly turned into breast milk. If she does not eat enough food, or does not eat foods with the right nutrients, she will have less milk. A mother makes 500–750 ml of milk per day. This depends on a regular supply of food. If a mother continues to breast-feed for several months without having enough food she will do so at the cost of her own body.

The amount of food a mother needs in both pregnancy and lactation also depends on the amount of work she does. If a woman has to do long hours of heavy work she must have more food than a mother who does not work. During pregnancy and lactation a mother should rest as much as possible so that her food can be used to help her baby grow.

Malnutrition in pregnant women

There is no precise way of detecting which mothers are undernourished during pregnancy. There are some women, however, among whom malnutrition in pregnancy can be suspected. They include:

- Women who are at a "high risk" according to a variety of factors;
- Women who appear malnourished; and
- Women whose previous babies have been small and malnourished.

'High risk' of malnutrition in pregnancy is found among:

- Women from very poor families;
- Widows or women who have been deserted by their husbands;
- Women who have given birth to many babies, especially over a short period of time or if the last delivery was less than a year ago;
- Women who are suffering from diseases such as tuberculosis and moderate-to-severe anaemia; and
- Women who gain very little weight during pregnancy.

The *appearance* of a pregnant woman can suggest whether or not she is malnourished. Observe if she is generally thin or wasted. See if there are loose folds of skin over her upper arms, chest, or abdomen, or if her arms and legs are very thin. These signs will tell you whether or not she has stores of fat under her skin. If a woman shows these signs she is probably malnourished.

All mothers suspected of being malnourished need extra help. They should be visited often. They should be encouraged to eat as much food as they can afford.

> If iron and other food supplements are available, pregnant women should receive these as a priority.

Anaemia ("weak blood") in pregnancy

Anaemia, or "weak blood", is a common nutritional problem in pregnancy. In countries or regions with a high incidence of hookworm infestation or malaria, anaemia is a very common problem. Women need healthy blood to nourish their babies during pregnancy.

How to tell whether a woman is anaemic

An anaemic woman will not have enough red colour in her blood. The blood will be pale, and if you look at inner side of the lips or the lower eyelids, they will be pale, light pink or white. These should normally look red. If a

woman is very anaemic she will easily become breathless after little exertion. Her face and feet may become swollen. Any woman in this severe condition should be referred to the supervisor or the nearest health centre. Visual aids are available in many countries to help community health workers to recognize anaemia.

Anaemia in pregnancy can be treated by a good mixed diet made up of the foods described below. The main nutrient that is required in the prevention of anaemia is iron. In many countries iron tablets are supplied to all pregnant mothers. One iron tablet should be taken every day with food. In pregnancy this should be taken from at least the third or fourth month onwards. Women should be warned that if they take iron tablets regularly their stools will be black in colour. In the health services of some countries, the community health workers are given the task of stocking and supplying these iron tablets. This is good because they get early information about who is pregnant. They can visit the women, give them the tablets, *and encourage them to take the tablets and eat a better diet.* Iron tablets should be kept out of reach of children. If swallowed in large quantities, they can be dangerous.

A good diet for pregnancy and lactation

During pregnancy and lactation a woman needs more food and a greater variety of food. *More food* is the first and most important thing. Diets based on cereals are generally good, but the woman needs more of them. She should eat one-fourth more food than she was eating before she became pregnant (25% extra). Find out how much she was eating before. Divide that into 4 portions. Tell her, or better show her, how much one of these portions is. This is the extra food she should eat, not only in pregnancy, but right through lactation.

> Pregnant and nursing mothers should eat for two persons.

A variety of foods will supply most of the nutrients a pregnant woman needs. These are listed below:

The *cereal grains* which are suitable for her diet include wheat, maize, sorghum, rice, and millet. It is better not to use refined or polished cereals because the nutritious part of the cereals is lost during such processing. Brown rice is more nutritious than polished white rice. Similarly, brown wheat flour (whole flour) is better than white refined flour. In some countries and in some cultures, cassava, yams, plantains, and potatoes are used in place of cereals.

Legumes or pulses are valuable, particularly for those who cannot afford animal foods or who do not eat them. The legumes include peas, beans, lentils, etc.

Vegetables, especially dark green leafy and coloured ones, such as tomatoes and carrots, supply special nutrients. Other vegetables and fruits are also useful.

Edible oils, butter, and sugar or molasses and their derivatives make food more tasty. They also supply energy in a concentrated form.

Animal foods are valuable but not essential. *Do not emphasize meat, eggs, fish, etc. in group teaching, if such foods are beyond the means of the community.*

TRAINING METHODS

1. *Lecture*: Training content.
2. *Demonstration in a clinic or health centre*: Identifying anaemic women and malnourished pregnant women.
3. *Community survey*: Feeding practices of pregnant women and prevalence of anaemia.
4. *Group discussion*: Findings of the survey and what can be done.

EXERCISES

Exercise 1. Finding out and classifying beliefs

The trainees should form pairs or small groups and visit a number of elderly women in the community. They should ask them about their traditional beliefs regarding food and diet during pregnancy and lactation. The trainees should then discuss with one another what they have learnt. All the beliefs should be classified into the 4 groups given below (it will probably be found that many beliefs fall into the last two categories):

- Good for nutrition—these should be used in teaching about nutrition
- Bad for nutrition—these should be tactfully discouraged or avoided
- Unimportant to nutrition
- Uncertain relationship to nutrition.

Exercise 2. Planning and setting up demonstrations to teach pregnant women and lactating mothers about nutrition

Plan and set up a demonstration for pregnant women and lactating mothers by following the instructions given below:

- Show two bottles containing 700 ml of milk. This is the amount of milk a healthy woman can produce daily 3 months after delivery.
- Show an average daily diet of the community. Next to it show how this diet can be made suitable for a pregnant woman and a lactating mother. In particular it should contain more food (25% more) and a better variety of food, especially green leafy vegetables. Explain the reasons for selecting certain types of food during pregnancy and lactation.
- Demonstrate ways of increasing the nutritive value of foods commonly taken in the area; e.g., by allowing beans to sprout, by fermenting cereals and by using the water in which rice or vegetables have been cooked.

Exercise 3. Role-play concerning the beliefs about foods in pregnancy

Characters: A community health worker
Pregnant woman accompanied by her mother-in-law

The community health worker advises the pregnant woman to eat more food and a mixed diet. The woman complains that her baby will grow too big. Mother-in-law says some foods are bad in pregnancy. The community health worker assures the woman that there is no such danger. She also tells the mother-in-law gently and tactfully that some of her beliefs are not good for nutrition.

Note. Before doing this exercise the community health worker should have tried to understand the reasons for the beliefs held by older women in the community.

Exercise 4. Detection of anaemia cases

Ask trainees to examine the inner sides of lower eyelids and the lips of several pregnant women for anaemia. Discuss the findings with them, with special reference to what advice should be given to mothers for preventing anaemia.

Exercise 5. Pregnant mothers at risk of malnutrition

Ask each trainee to think of one woman in the community who might be at risk of malnutrition. Ask her to give reasons why that woman is at risk and what should be done.

Exercise 6. Role-play concerning iron tablets in pregnancy

Characters: A community health worker
Anaemic pregnant woman who has not been taking her iron tablets
Neighbour who had a normal delivery and child without taking iron tablets.

The community health worker inquires why the anaemic woman has not been taking her iron tablets. The anaemic woman complains that she took a few tablets but she had abdominal pain and black stools. The neighbour says the woman was all right without taking any tablets. The community health worker explains and encourages the woman to continue taking the tablets.

Exercise 7. Reviewing local proverbs

Review local proverbs to see if any of them are related to feeding in pregnancy and lactation. Discuss how these can be used in nutrition teaching.

MODULE 6

IDENTIFICATION, MANAGEMENT, AND PREVENTION OF COMMON NUTRITIONAL DEFICIENCIES

LEARNING OBJECTIVES

After studying this chapter, taking part in the discussions, and doing the exercises, a community health worker should be able to:

- Recognize the main types of protein–energy malnutrition in order to be able to take appropriate action.
- Explain the main causes of protein–energy malnutrition to the mothers.
- Identify children at risk of developing protein–energy malnutrition and advise their parents.
- Help parents to improve the diet of those children who are suffering from moderate malnutrition.
- Identify children with vitamin A deficiency, those at risk of developing this deficiency, and take action to treat and prevent vitamin A deficiency.
- Identify children with anaemia and those at risk of becoming anaemic, and take action to treat and prevent anaemia.

TRAINING CONTENT

Recognizing the main types of protein–energy malnutrition

A person develops protein–energy malnutrition when: (*a*) his diet does not contain enough protein- and energy-giving foods; (*b*) the absorption of energy-giving nutrients and protein is reduced because of illness; and (*c*) increased need for protein and energy-giving nutrients in illness is not met. Energy deficiency is probably more common and important than protein deficiency. Usually if a diet is adequate in energy, it will contain enough protein. Protein–energy malnutrition is a very common condition among children under 5 years of age in poor communities. In some countries 4 out of 5 young children have some degree of this malnutrition, and 1 out of 10 will be seriously affected by it. This means there are millions of children with protein–energy malnutrition in the world. Children with such malnutrition have a much higher death rate than adequately nourished children. Protein–energy malnutrition and infectious diseases often occur together; this is discussed further in Module 7.

> It is important to identify children with malnutrition at the earliest possible stage in order to cure them more effectively.

The first sign of all forms of protein–energy malnutrition is growth failure. The importance and methods of measuring growth are described in Module 2. *Growth failure can be seen most clearly on a child's growth chart.* Weeks or months before a child looks malnourished he will have stopped growing. Weighing a child regularly, plotting the weights on a growth

chart, and noting the direction of the growth line are the most important steps in recognizing early malnutrition. The severe forms of malnutrition are described below, but a community health worker should be able to identify cases of malnutrition at an early stage when there is growth failure. The severe forms will never occur if the community health workers take appropriate measures at the first sign of growth failure.

> Growth failure is the earliest sign of protein–energy malnutrition.

There are two severe types of protein–energy malnutrition: nutritional marasmus (Fig. 29) and kwashiorkor (Fig. 30).

Marasmus

Children with marasmus are very thin and wasted. They have been called "skin-and-bone children". The fat under the skin has been used up, and there are loose folds of skin over the arms, legs, and buttocks. The muscles are wasted and as a result the arms and legs are thin and all the bones stand out. The abdomen is distended, partly because the abdominal muscles are weak. The face is also wrinkled and the bones stand out. The child looks like a "worried old man". The hair is usually normal in colour, but may be rather sparse (not thick). Marasmic children are usually hungry.

The growth chart of a typical marasmic child is shown in Fig. 31. The growth failure starts early in life (most marasmic children are between the ages of 6 and 24 months).

Malnutrition is a chronic condition. When a child has been malnourished for a long time the growth failure can be seen in several ways. He is not only thinner than a normal child of the same age (wasted), but also shorter (stunted) (Fig. 32).

Children from poor families fed on bottle milk from the early months of life often develop marasmus. This is usually because the milk is diluted too much or repeated infections in the child reduce his appetite and the child refuses to eat or drink. Diluted milk does not have enough energy and other nutrients in it. Furthermore, the milk is fed through dirty bottles and as a result the children often suffer from diarrhoea. This leads to marasmus, and the children weigh about half the weight of healthy children of their age.

Fig. 29. A child with marasmus

Fig. 30. A child with kwashiorkor

Kwashiorkor

This is the more serious form of protein–energy malnutrition. The most evident sign of this condition is body swelling (called oedema), especially swelling of the face, forearms, hands, legs, and feet. The abdomen, and genitals may also be swollen. It is possible to make a mistake and think that these children are fat. Test the swelling over the front of the lower leg bone. Press with your thumb for half a minute. There will be a hollow depression when you remove your thumb. This does not happen with a child who is just fat.

Children with kwashiorkor are always unhappy and often irritable. Many of them cry for long periods. They sit still and take no interest in anything, not even in food. Many of them have no appetite. Some children with kwashiorkor have abnormal skin and hair. The skin is often paler than normal, and over the legs there may be lines and cracks. Sometimes, dark patches of chocolate or brown colour appear on the skin. Sometimes the skin peels off in small pieces like old paint. Some children have sores from which fluid flows. The hair of some children with kwashiorkor is pale, brownish, white, and sparse, and the hairs are thin and break easily.

Kwashiorkor is also associated with other conditions, including infections. The growth chart of a typical child with kwashiorkor is shown in Fig. 33. Kwashiorkor may occur at a later age than marasmus, often in children aged between 18 and 48 months. In Fig. 32 notice that the child was growing quite well until he was over 2 years old. Then he had an attack of measles, and soon after that he developed kwashiorkor. Children with kwashiorkor may also have anaemia and vitamin A deficiency that affects the eyes (see sections on vitamin A deficiency and anaemia below).

While examining a child suspected of suffering from kwashiorkor, look carefully at the upper arms, shoulders, and chest. If there is wasting and the bones stand out, the child is said to have marasmic kwashiorkor. Because of the swelling, the wasting of the legs is not seen.

The signs of protein–energy malnutrition (wasting, swelling, changes in skin and hair) are all quite easy to see. *Remember, however, that the most important and early sign of malnutrition is growth failure.* This will only be detected if children are weighed regularly and their weights are plotted on growth charts each time they are weighed.

> Regular weighing of children is the best way to detect protein–energy malnutrition.

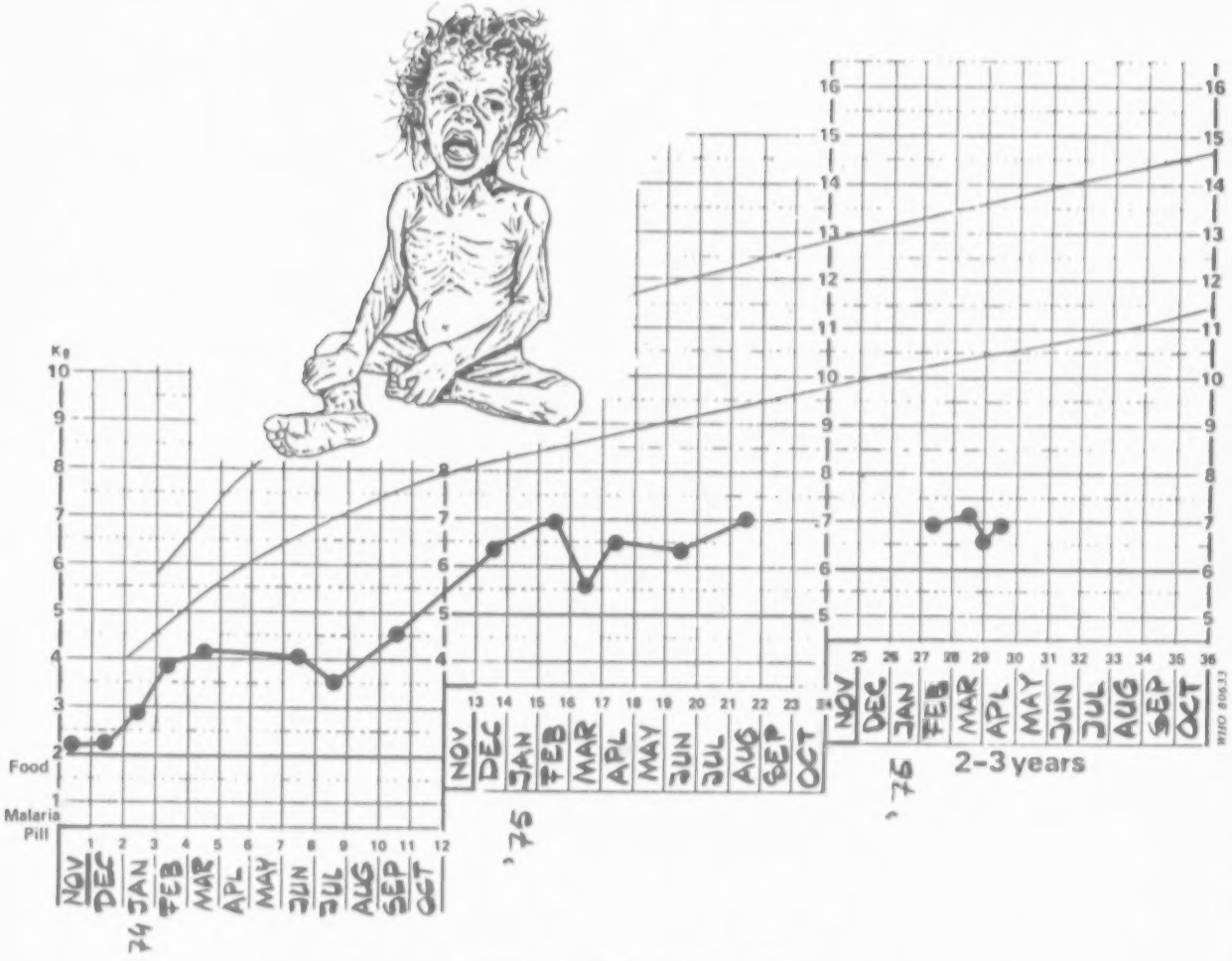

Fig. 31. A growth chart of a typical child with marasmus

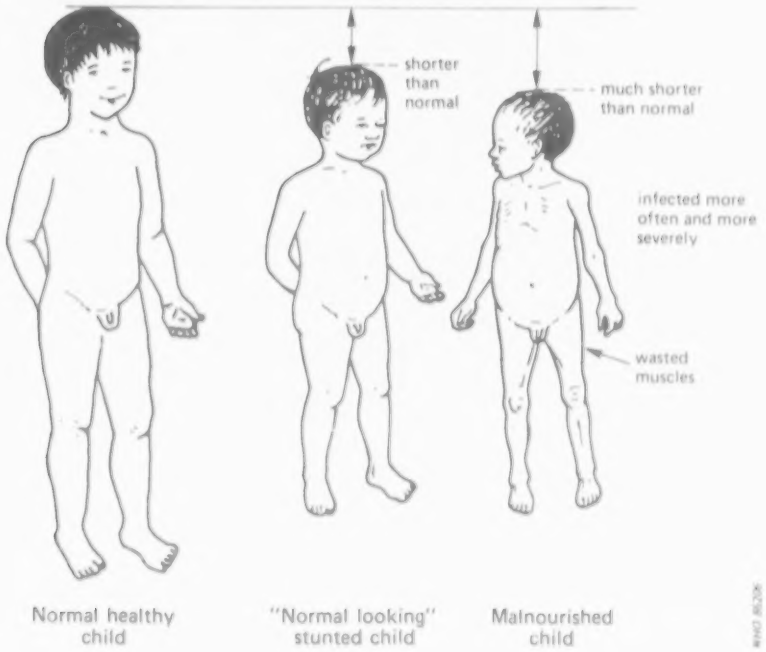

Fig. 32. Characteristics of the underweight child

Understanding the causes of protein–energy malnutrition

General factors

Malnutrition is caused by a number of complex and closely related factors which relate to the social and economic condition of the family. Some of the general factors are: *poverty*, *ignorance*, *superstition*, *lack of food*, *inadequate hygiene* (lack of cleanliness), and *infectious diseases* in the area where the family lives. The interrelationship of these factors is complex and the community health workers need not go into the details. However, these factors cause specific problems about which a community health worker can do something.

> Repeated infections and insufficient dietary intake are the main causes of growth failure.

The simplest way of understanding how these factors cause the development of protein–energy malnutrition is to take an example of a typical family in a poor community. The family can be big or small. Since the family is very poor both the mother and the father have to go out to work, and often the mother is away from home for the whole day. Their small baby is left at home without any breast milk or any good alternative food for the period the mother is away. Since the baby does not suck frequently enough at the mother's breasts, the mother is not producing enough milk. The family has some incorrect beliefs (superstitions) about feeding any solid food to the child until he is 1 year old. The parents are ignorant and do not have the time to take their children for immunization. As a result the baby is not getting enough breast milk or any other alternative food. He is left alone without his mother. Furthermore, he has not had any immunization and as a result he frequently falls ill with infectious diseases. The combined effect of all these things is protein–energy malnutrition. It is important to note that the community health worker can do a number of things to reverse the effects of poverty, superstition, and ignorance on this child.

Specific factors

So far we have considered some of the general factors that lead to malnutrition. Let us look now at some specific factors:

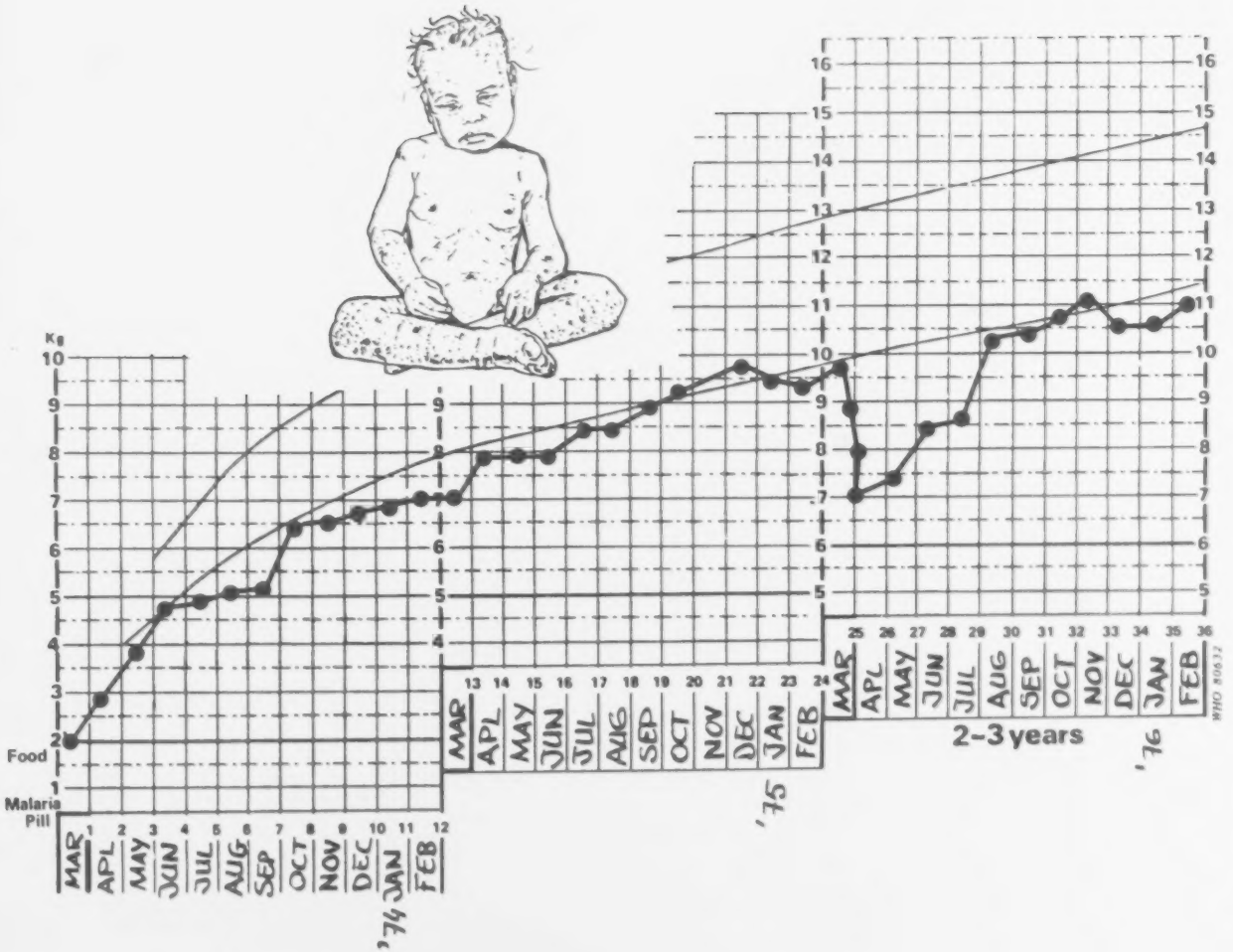

Fig. 33. Growth chart of a child with kwashiorkor

- *Age*. Between the ages of 6 months and 48 months, the risk of protein–energy malnutrition is great because the child is growing fast and the food commonly given to the baby is not adequate. On top of this, infectious diseases are very common.
- *Sex*. In many cultures boys are valued more than girls for social and economic reasons. Girls may be consciously or unconsciously neglected.
- *Many children*. In large families there is often less food for each person. The smaller children may be neglected because the mother has too much work.
- *Short interval between births*. If a mother becomes pregnant when her previous baby is only 6 months old, she may neglect the older child. Her breast milk will get less and her time and attention will be concentrated more on the new baby.
- *Low birth-weight*. Babies who are small at birth have not had enough nourishment in their mother's womb. Many of them become malnourished.
- *Twins*. These children have a combination of high-risk factors. They are small and may receive only half as much milk and attention from the mother as a single baby.
- *Poor growth in the first few months*. This can only be judged by weighing the baby regularly. A child should gain at least 500 grams a month in the first 3 months of life. Many children who gain less weight become malnourished. There may be a number of reasons for this, but the most important is the mother's failure to breast-feed.
- *Failure or stoppage of breast-feeding*. This may be inevitable if the mother dies soon after the baby is born. Often, however, the mother stops breast-feeding because of the false belief that bottle feeding is modern and therefore good. Sometimes she has to start outside work very soon after the baby is born and there is nowhere to breast-feed him at her place of work.
- *Delay in introducing additional food*. Breast milk is best and should be given up to 2 years of age. However, other foods should be started after 4 months and increased in amount as the child grows older. If this is not done growth will slow down, and this may be the start of malnutrition.
- *Infectious diseases, especially repeated diarrhoea, whooping cough, or measles*. Infectious diseases themselves, may result in malnutrition directly or indirectly because it is often wrongly thought that a sick child should be given less food than a healthy one.

The risk factors in different communities will vary. Study the economic and social situation of the families of malnourished children. This will show what are the specific causes of malnutrition in a particular area.

Identifying children at a high risk of developing protein–energy malnutrition

A community health worker is responsible for the care of every child born in the community. For each child she must ask herself "Is this child at high risk of malnutrition?" If the answer is "Yes", time and care must be concentrated on that child. Less time will be devoted to those children who are well and are not at risk.

Consider two extreme examples. The only boy child born to the village chief (who owns much land and whose wife is a healthy high-school graduate) has a very low risk of becoming malnourished. On the other hand, the twin daughters of an unemployed labourer whose wife died soon after giving birth to these children are at a very high risk of becoming malnourished and dying. The community health worker must visit these girls very often. Whoever looks after the girls will need much help and encouragement.

Sometimes all the malnourished children may belong to one specific group in the community. For example, these may be the children of landless labourers and their mothers may be illiterate. In such a situation the community health worker should concentrate her attention on that group.

How can the community health worker help the high-risk children and their mothers? The main resources of a community health worker are her knowledge about feeding children and her desire to help. She should make friends with mothers of children at high risk. She should visit these children frequently, especially from 4 months of age. That is when mothers should start introducing other foods. She should gently and repeatedly advise about feeding (see Module 4). Finally she should weigh the children each month. The supervisor should visit the community occasionally and show interest in the progress being made; this will encourage the community health worker and the persons she serves. A programme of visits can be worked out according to the number of children to be visited. In a pro-

gramme in one large community, visits were made monthly until the malnourished children in that community were 5 months old, then every 2 days until the children had started taking food regularly several times a day, and then about once a week to make sure that the amount of food was being increased. This simple schedule greatly reduced the number of malnourished children in that community. Simple nutritional knowledge combined with concern and compassion can achieve much.

A list of factors increasing the risk of malnutrition is described in Module 1 Section 2.3.

A community health worker can help most children with mild or moderate malnutrition.

Management of children suffering from protein–energy malnutrition

Two groups of children need special help from the community health worker. The first—children *at risk* of developing protein–energy malnutrition—have been considered above. The second group is the *children already suffering from protein–energy malnutrition*. They can be identified by regularly visiting the homes of high-risk families, by observing the growth charts of children, and by examining children with infectious diseases like measles and diarrhoea. These children can be easily treated at home through better feeding. What the parents can do is described on the following pages.

Modification and improvement of the diet is one method a community health worker can use to manage malnutrition. But it will fail unless the family, and especially the mother of the child, cooperates actively. Convincing the parents that a modified diet is essential for the child may be the most difficult task of the community health worker. The mother should be convinced that what her child needs is not medicine, but a diet which she can afford but which needs careful preparation. A community health worker may know what foods a child should eat, but the mother must also believe in this and must be willing to make the best use of foods available to the family. Involving the family in the process of recovery is the best way to teach about malnutrition and prevent its recurrence. The parents will learn about better nutrition by seeing their children recover and become healthy. It is important to find out from the mothers why less food is being given to their children and why they follow certain feeding patterns. Proper advice will depend on such understanding.

Some instructions for the better feeding of malnourished children are:

- *Give more of the food you are already giving.* This is particularly useful if the child is already eating a mixed diet of cereal and legumes, and preferably some vegetables.
- *Increase the number of meals per day.* This is one good way of giving the child more food. A child with malnutrition should eat 5–6 times a day. Each meal should be substantial and not simply a snack.
- *Increase the variety of foods being given.* If a child is eating mainly cereals and legumes, gradually add leafy green and other vegetables.
- *Add edible oil to the diet if possible.* This can be vegetable oil or butter. This will not only increase the energy content of the diet, but also make it tasty and acceptable; as a result, the child will eat more. Since oils have high energy, their addition to an infant's diet will make it possible to reduce the bulk of the diet.
- *If possible, give some foods which come from animals.* Even small amounts of eggs, milk, meat, or fish will help a malnourished child recover rapidly. Usually foods from animals are expensive and poor families do not eat them regularly. Emphasize that these foods are not essential, but will help when the child is seriously malnourished.

Regular weighing is a good way to know the progress of a malnourished child.

The effects of better feeding can be very encouraging to both the parents and the community health worker. Improvement can be seen by regular weighing of the child. Watch for the gain in weight and discuss this with the parents.

Supplementary feeding programmes can be used specifically to help malnourished children. In many countries there are special programmes in which milk or meals are distributed to children below school age. *To make the most of the foods available in these programmes, the supplements should be specifically provided to malnourished and high-risk children.* The selection of children in the community who really need such supplemen-

tary food should be done in consultation with supervisors and community leaders. Mothers should understand that the needs of a malnourished child are urgent, and that the supplementary food should not be shared with the whole family.

The help of the community may be required in the case of malnourished children of very poor families. The community health worker and the health supervisors may be able to persuade community leaders and wealthy farmers to help. These people may provide food for specific children or families in need of urgent help. In the end, better nutrition of the whole community will depend on education and on social and economic development, but there are many useful things a community health worker can do immediately.

> Some children needing special care should be referred to the supervisor or health centre.

Some children need very special care because their lives are in great danger. These children should be referred to the supervisor or the health centre. However, they will still need the support and help of the community health worker. The children who need to be referred to the supervisor or the health centre are described below:

- *Children with severe malnutrition.* These include very wasted marasmic or greatly swollen kwashiorkor children who will not eat.
- *Children with complications of malnutrition.* These include children with anaemia and eye damage due to vitamin A deficiency (see sections on vitamin A deficiency and anaemia below), and children with signs of infections, high fever, distressed breathing, and repeated diarrhoea.
- *Children with moderate malnutrition who do not improve with the feeding and help suggested below.* These are children who have some infection which is difficult to diagnose, e.g., tuberculosis. Refer these children to the supervisor or to the health centres.

Identifying children in danger from vitamin A deficiency

A young child needs protein and energy in food to build tissues and to be healthy. To remain healthy the body also needs small amounts of special substances. These are called vitamins and are found in various foods. Vitamin A is one of these special substances which is especially important for the health of the eyes in small children.

Vitamin A deficiency is the main cause of blindness in some countries. Blindness in children can result in a lifetime of misery. Blind children cannot care for themselves and they are a burden on the family. Many blind children are neglected and become malnourished and die. The community health worker can do much to improve this sad situation. She can identify children suffering from early vitamin A deficiency and can recommend treatment. She can prevent vitamin A deficiency by giving suitable dietary advice.

When a child or a person has vitamin A deficiency he cannot see very well in the dark. This condition is called night blindness. This is an early stage of vitamin A deficiency. Ask mothers if they have noticed that their children cannot see properly in late evenings or in semi-darkness. In some areas this disease is so common that there is a local name for it.

Examine the eyes carefully. A child who has vitamin A deficiency has eyeballs which, unlike normal ones, are not moist, smooth and shiny. This condition is called xerophthalmia. This is the early stage of vitamin A deficiency, when foamy patches appear on the sides of the eyeballs. The patches, usually triangular in shape, pearly white or yellowish in colour, are found in both eyes. These are called Bitot's spots (Fig. 34). These spots may persist even after treatment.

At these early stages, an improved diet can prevent serious eye damage. It requires considerable practice to detect vitamin A deficiency. Supervisors should work closely with community health workers in detecting the early signs until the community health workers are well trained.

In the later stages the eyeball becomes soft and an ulcer may form. The eye finally bursts and is permanently damaged. This is known as keratomalacia.

Certain groups of children are at special risk of vitamin A deficiency. These include children with protein–energy malnutrition and children with certain infections. Measles affects many body tissues including the eyes. Diarrhoea affects general nutrition and also the absorption of vitamin A from the bowel. Vitamin A deficiency often appears after measles or diarrhoea. If the community health worker knows who may develop the deficiency she can act to prevent the disease.

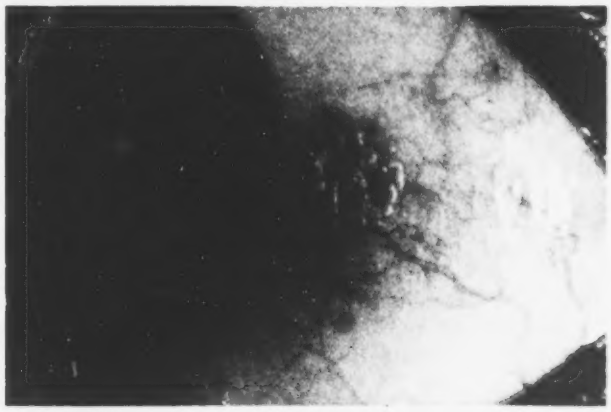

Fig. 34. Bitot's spots

Action to treat and prevent vitamin A deficiency

Treatment of vitamin A deficiency

Vitamin A deficiency should be treated urgently. The early stages of xerophthalmia (dry eyes) can lead to total eye damage within a very few days. If a child has dry eyes, the community health worker should act quickly.

- Give an oily preparation of vitamin A (200 000 International Units) by mouth. This may be in the form of drops or a capsule. This form of vitamin A is absorbed nearly as fast as a dose of vitamin A in water given as an injection. In some countries community health workers keep stocks of such vitamin A.
- If no vitamin A is available, take or send the child to the nearest health centre or a place where it is available.
- Teach the parents of children treated with vitamin A for dry eyes about prevention.

Prevention of vitamin A deficiency

Prevention can be for an individual or a community group that is at risk of vitamin A deficiency.

- An appropriate diet is the most important preventive measure.
- Vitamin A can be made in the body from a compound called carotene, which is found in vegetables and fruits. A lot of carotene is found in yellow or orange vegetables and fruits, leafy green vegetables, and red palm oil. Vitamin A is present in animal products such as eggs, liver, milk, and fish-liver oils.
- Vitamin A supplementation programmes have been started in some countries. In these programmes all children between 6 months and 5 years of age should receive oily preparations of vitamin A (200 000 International Units) by mouth, every 6 months. This may be in the form of drops or capsules. Such large doses of vitamin A can cause some children to feel unwell for a brief period. They may have headache, vomiting, and fever. The effects however, pass off quickly. Give the child half a tablet of aspirin and reassure the mother. *It is dangerous to give a bigger dose, or to give vitamin A more often than once in 6 months.* Keep vitamin A preparations out of reach of children. It is important to record how often these big doses of vitamin A are given to children.
- When using individual growth charts, a large A should be written at the bottom of the column of the month in which the dose was given. In this way it is easy to see when the last dose was given, and when the next dose is due.

All cases of vitamin A deficiency in children should be treated urgently.

Identifying children with anaemia and those at risk of becoming anaemic

Children with anaemia

An anaemic child has weak or pale blood. Many children and women of poor families in developing countries have anaemia.

How can a child with anaemia be identified? A child with anaemia is less active than a normal child. He may be pale, and if the condition is severe, he will be breathless and have some swelling of the face, body, and limbs. The best way to detect anaemia is by examining the inside of the lips and the inside of the lower eyelids. They will be pale, light pink, or whitish instead of red (Fig. 35). A good time to gently pull down the eyelids of a child and to look at the colour is when he is feeding at the breast. The above test is very simple and every sick child should be examined for anaemia. Identification of anaemia in pregnant women is described in Module 5.

There are many possible *causes of anaemia* in children:

- The most common cause of anaemia is a diet deficient in food that contains iron. The body cannot make enough blood if it does not have enough iron. A growing child needs a lot of iron. He needs iron to make blood, but his main food is milk, and *milk contains very little iron.* Unfortunately, many children do not much like the foods which are rich in iron, for example, leafy green vegetables.
- A child may become anaemic because of loss of blood. Often the blood loss is not seen. For instance, a child may lose much blood because he has worms in his intestines which suck the blood.
- Anaemia may result from red blood cells being damaged in a number of ways. Malaria parasites are one serious cause of damage to blood cells.
- Anaemia may also occur in babies if they start life with too small a store of iron. If a mother is healthy, in the last weeks of pregnancy she will pass on to the baby a store of iron. If the mother is anaemic, she will not have much iron to pass on to the baby. If the baby is born prematurely, he will not receive the store of iron.

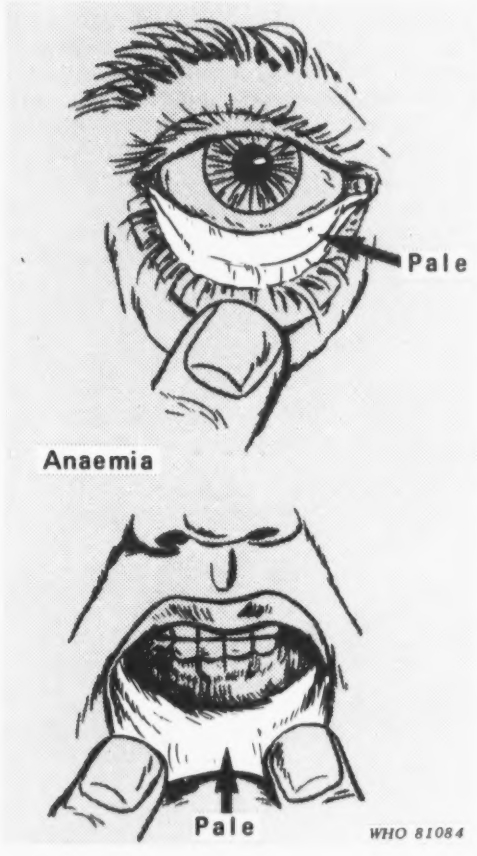

Fig. 35. Where to look for signs of anaemia

Children at risk of anaemia

From the causes of anaemia it is possible to identify the groups of children at risk of this disease. They include children who are premature (born early), those with anaemic mothers, those who have been fed too long on milk only, and those who have not been given a mixed diet including iron-containing foods. *Children who are not protected from parasites, particularly malaria and hookworm, will develop anaemia.*

Action to treat and prevent anaemia

Treatment of anaemia

- A diet which is rich in iron-containing foods like leafy vegetables is a good start, but it is unlikely to provide sufficient iron to cure anaemia.
- Iron tablets or syrup preparations easily increase the intake of iron. If the community health worker has a supply of iron tablets or syrup for children, she should give the recommended dose, as directed by the local supervisor or the doctor in charge.

Occasionally iron tablets upset digestion. This effect is less if the iron tablets or syrup are taken at the same time as food. Warn mothers that their children's stools will be *black* while they are taking iron medication. Iron tablets or syrup can cause harm if too large a dose is

taken at one time. Always keep iron preparations out of reach of children. It is best to keep iron and other medicines locked in a cupboard.

- In severe cases of anaemia the patient is swollen, breathless, and very pale. These children or adults should be referred to a hospital. They need special care, and possibly blood transfusion.
- Treatment of any cause of blood loss or damage is essential. Malaria and hookworms should be treated. The possibility of these infestations should be thought of in any case of anaemia. It will be necessary to take or send patients to a health centre or hospital for diagnosis and treatment of such infections.

Prevention of anaemia

- A good diet during pregnancy is the foundation for prevention of anaemia. This will build up the mother's iron supply so that she can pass on a full amount to her child in late pregnancy. It will enhance full development of the child in the mother's womb and decrease the chance of a premature birth.

The diet should be rich in iron-containing foods—leafy green vegetables, legumes, whole grain cereals, and molasses. If animal products are acceptable and can be afforded, eggs, meat, and liver can be given. Pregnant women frequently need supplements of iron in addition to a good diet (see Module 5).

- Premature babies have inadequate iron stores and should be given small doses of iron in the first 3 months of life. Suitable iron mixtures will have to be obtained from a health centre.
- Infants should have a mixed diet containing iron-rich foods from about 6 months of age (see Module 4).
- Hookworm infestations can be prevented by improved hygiene, use of latrines, and wearing some form of footwear.
- Malaria control measures are being undertaken in many countries. Some services use anti-malarial tablets to prevent malarial infections. If this is being done in the community, issue anti-malarial tablets to children and record it on the individual growth charts.

TRAINING METHODS

1. *Lecture*: Training content. Use photographs or other visual aids.

2. *Demonstration in a clinic or health centre*: Identification of cases of moderate protein–energy malnutrition, marasmus, kwashiorkor, vitamin A deficiency, and anaemia.

3. *Community survey*: Identifying cases of protein–energy malnutrition, marasmus, kwashiorkor, vitamin A deficiency, and anaemia in the community, and their major causes.

4. *Group discussion*: Findings of the survey and what could be done about the problems.

EXERCISES

Exercise 1. Identifying malnourished children in the community

In this exercise the trainees carry out a survey to identify all malnourished children below the age of 5 years in a community. There are two important points to consider. First, the survey should cover the whole community. Secondly, each trainee should visit at least 10 homes.

At each visit the trainee first counts the total number of children in the family. Then she notes down the number of children below the age of 5 years. Now by measuring the upper arm circumference (see Module 2) or by looking at the growth charts of the children and judging from either the weight of the chiid at its present age or the direction of the growth line, she decides which children are malnourished. One of these two methods should be decided upon before undertaking the survey but it should be remembered that measuring the upper arm circumference is not suitable for children less than 1 year old. Upon completing the survey the trainees add up their results and discuss the following questions.

(1) What proportion of children below the age of 5 years in the community are malnourished?
(2) Are there common features among the families having malnourished children?
(3) How can these children and their families be helped?
(4) How often should the community health worker visit each child?
(5) Do most malnourished children come from one group in the community (e.g., one caste or profession)?

Exercise 2. Identifying children with marasmus and kwashiorkor

If any cases of marasmus or kwashiorkor are detected while Exercise 1 is being done, ask the permission of the parents of these children to allow the whole training group to see the children. Then discuss how the appearance of these children differs from that of healthy children of the same age.

In the second part of this exercise the trainees work in pairs. Each pair is given an illustration showing one of the two conditions. The trainees are then asked to answer the following questions:

(1) What kind of malnutrition does the child in the illustration have?
(2) What nutrition education would you give to the parents of this child?
(3) What else could you do to help the families?

Ask the trainees to exchange the illustrations and correct each other's answers.

Exercise 3. Identifying causes of malnutrition and their prevention

In this exercise trainees can work in pairs or singly. They visit the homes of children diagnosed as having moderate or severe malnutrition. Ideally, one whole

day should be spent in or near each home. The purpose of the visit is to try and find out why the child became malnourished by observing how the family lives. In preparation for this visit, the trainees should outline the type of information to be collected.

The trainees should then meet, present the observations they have made in the different families, and discuss the findings. Particularly, they should consider, for each family, what changes in the way of life would prevent the child from becoming further malnourished. The following questions will be useful in the discussion.

(1) Will it help to change the pattern of meals (frequency and timing of meals) in the home?
(2) Are the parents spending their money on the right kinds of food?
(3) Is the child immunized against the childhood diseases? If not, will immunizations help?
(4) Do the parents have enough time to adopt the feeding and child care practices that will be necessary?

Exercise 4. Detection of anaemia and vitamin A deficiency

The trainees with their supervisor should visit a nursery school, baby clinic, or an outpatient hospital where there are many small children. With the permission of the person in charge, they should examine the eyes, the lower eyelids, and lips of all the children there. Probably some children will show signs of anaemia and vitamin A deficiency. The normal children can be compared with those who have deficiencies.

Remember it is important to help the families of the children who are found to have anaemia and vitamin A deficiency. They should receive advice about diet and, if possible, vitamin A and iron tablets or syrup.

Exercise 5. Visit to a nutrition rehabilitation unit

If possible the trainees should work in a nutrition rehabilitation unit for some days. The purpose of these visits is to observe:

(1) How malnourished children are helped to recover; and
(2) How parents of malnourished children may be taught to feed children so that they grow well.

In such a unit the trainees will see how local foods are prepared in order to make them especially suitable for small malnourished children, how often the children are fed, how much they need to eat, and how mothers are taught to take care of their children so that they do not suffer from malnutrition in the future.

Exercise 6. Developing positive attitudes of women towards feeding children green and yellow vegetables and fruits

The trainees should interview a number of women to find out their attitudes and beliefs towards feeding children green and other vegetables. There are often strong beliefs about giving these items to children. The trainees should then discuss how to overcome any problems they find. For example, are leafy vegetables acceptable to mothers and children when mixed in a curry? Are carrots and pumpkins acceptable when made into a sweet? Is mashed, fresh papaya given to children?

Exercise 7. Role-play about diet and malnutrition

(1) *Recognizing kwashiorkor or marasmus*

Characters: A mother
A child with kwashiorkor or marasmus
A clinic nurse

The mother describes how she believes her child became ill. The child displays the characteristics of kwashiorkor, acting miserable, apathetic, etc. The nurse points out the features of the illness and explains what caused it and what can be done to help the child to recover and what actions should be taken to avoid relapse.

(2) *Changing the family diet pattern*

Characters: A mother
A father
A grandmother
A community health worker

The purpose is to show how to overcome the personal desires and prejudices of different family members. Father wants the sort of food that he likes. Mother wants to make changes for the sake of her malnourished child. Grandmother objects, saying that certain foods will be bad for the child. The community health worker advises gently and helps to find a compromise within the cultural pattern with which the family members agree. There is scope for the use of proverbs, jokes, and songs.

Exercise 8. Identifying a family at high risk of malnutrition

Each trainee should describe one family she knows in which she believes the children are at high risk of malnutrition. She should explain why she believes it is a high-risk family.

MODULE 7

NUTRITIONAL CARE DURING DIARRHOEA AND OTHER COMMON INFECTIONS

LEARNING OBJECTIVES

After studying this chapter, taking part in the discussions, and doing the exercises, a community health worker should be able to:

- Explain the causes and dangers of diarrhoea to mothers.
- Detect children who have lost much water and salts through their stools (dehydration) and advise the mothers about what is to be done.
- Advise mothers about feeding during and after diarrhoea.
- Explain to a mother how the common infections in children make them malnourished, and again how infection is worse and more frequent in malnourished children.
- Advise mothers about feeding during common infections of children.
- Help to control infectious disease by taking part in local immunization programmes.

TRAINING CONTENT

What is diarrhoea?

Diarrhoea is a condition in which stools are passed more frequently and are looser or more watery than is usual for the person. People vary in the type of stools they pass, and in how often they pass them, but as a general guide, *three or more loose or watery stools in a day can be considered as diarrhoea*. Frequent passing of normal stools is *not* diarrhoea. Breast-fed babies often have stools that are very soft, but this too is *not* diarrhoea.

A mother usually knows when her child has diarrhoea. When diarrhoea occurs, mothers may say that their children's stools smell strongly or pass noisily, as well as being loose or watery. By talking to mothers, a useful local definition of diarrhoea can often be found.

Diarrhoea is most common between 6 months and 3 years of age. It is also common in babies less than 6 months old who are drinking cow's (or another animal's) milk or infant feeding formulas.

Diarrhoea is an illness that requires immediate care. It should never be neglected.

Why is diarrhoea dangerous?

The two main dangers of diarrhoea are death and malnutrition.

Death from diarrhoea is usually caused by the loss of large amounts of water and salts from the body in the frequent watery stools. This is called *dehydration* (see the section on dehydration below). Small children with severe diarrhoea lose water and salts rapidly and can die quickly, sometimes within a few hours. Many children with diarrhoea recover by themselves, but they become weak.

Malnutrition can be caused by diarrhoea because food passes too quickly through the

body and therefore cannot be absorbed properly. Moreover, a person with diarrhoea usually feels too ill to be hungry and so does not eat. Adults suffering from diarrhoea are often afraid to eat because they think that eating will make their diarrhoea worse. Diarrhoea is more severe and more common in people who are already suffering from malnutrition.

In many communities it is a common practice to starve children when they have diarrhoea. Sometimes, even breast-feeding is stopped. This is *wrong* because it causes malnutrition, which will make the child have diarrhoea more frequently. To prevent malnutrition in children with diarrhoea it is important to give them correct treatment and proper nutrition.

What causes diarrhoea?

Diarrhoea is caused by an infection of the bowel by very small germs or organisms that cannot be seen by the naked eye. They enter the mouth and then the bowel through dirty hands, dirty food, dirty milk, dirty water, dirty feeding bottles, dirty cooking pots and feeding vessels, and so on. Some of them are also passed out in the stools. When other people come into contact with these germs, because of lack of cleanliness, the infection spreads.

What causes dehydration?

The body takes in water and salts from drinks and food. When the bowel is healthy, the water and salts pass from the bowel into the blood and are then carried to all parts of the body to be used. The water and salts that the body does not need are passed out through stools, urine, and sweat. Water and salts may also be lost by vomiting.

When there is diarrhoea, the intestines do not work normally and the water and salts pass into the blood very slowly or not at all. As a result, the body does not take up as much salt and water as it needs to replace what it is losing, and more than the normal amounts are passed in the stools. Thus, the body is drained of water, salts, and nutrients; this is *dehydration*. Diarrhoea may sometimes be accompanied by vomiting, which increases the rate of dehydration.

The worse the diarrhoea, the more water and salts a person loses and the more he is dehydrated. A lot of vomiting and sweating can also cause dehydration. Dehydration occurs faster in hot climates and when there is fever.

Detecting children who have lost much water and salt from diarrhoea (cases of dehydration)

All children with diarrhoea are in danger. Many children recover, but some become seriously ill. How can the community health worker identify the children who need urgent care? Four things they should do are: *ask*, *look*, *feel*, and *weigh*. The signs of mild or severe dehydration and ways of detecting them are summarized in Table 4.

It is important to know if a child is only mildly ill or seriously ill because this affects the action you should take. A child who has mild diarrhoea can be treated at home, but a child who has severe diarrhoea, dehydration, and complications should be sent to the nearest health centre for special treatment.

Deciding which children need special treatment

Special treatment is required by children with diarrhoea if they:

- Have severe dehydration
- Have other diseases and complications of diarrhoea
- Do not improve with the treatment described in the section below.

The community health worker should be able to recognize such children, and should send them as soon as possible to a supervisor, health centre, or hospital.

- Dehydration is dangerous in diarrhoea.
- Dehydration is caused by loss of water and salts from the body.
- Save a child with diarrhoea by rehydration.

What is rehydration?

The easiest way to save the life of a child with diarrhoea and dehydration is to replace the lost water and salts by giving him a solution of water and salts by mouth. This is called rehydration. This can be done by adding clean water to a specially prepared mixture of salts available as a powder in sealed packets. Salt and glucose are the two main ingredients of this mixture. This salt mixture is known as *Oral Rehydration Salts* (*ORS*). Mix the contents of one standard packet of oral rehydration

Table 4. Steps to take to identify children with dehydration

What to do		Signs to look for	Signs to look for	Danger signs
1. ASK	DIARRHOEA	Less than 4 liquid stools per day	4–10 liquid stools per day	More than 10 liquid stools per day or Much blood and mucus
	VOMITING	None, or small amount	Some	Very frequent
	THIRST	Normal	More than normal	Unable to drink
	URINE	Normal	Small amount, dark yellow	No urine for 6 hours
2. LOOK AT	CONDITION	Well, alert	Unwell, sleepy or irritable	Very sleepy, floppy, unconscious, having fits or convulsions
	EYES	Normal	Sunken	Very dry and sunken
	MOUTH and TONGUE	Wet	Dry	Very dry
	BREATHING	Normal	Faster than normal	Very fast and deep
3. FEEL	SKIN	A pinch goes back quickly	A pinch goes back slowly	Pinch fold goes back very slowly
	PULSE	Normal	Faster than normal	Very fast, weak, or cannot be felt
	FONTANELLE (in infants)	Normal	Sunken	Very sunken
4. WEIGH	(if possible)	No weight loss during diarrhoea illness	Weight loss of 26–100 grams for each kilogram of weight	Weight loss of more than 100 grams for each kilogram of weight
5. TAKE	TEMPERATURE (if possible)	—	—	High fever: more than 38.5 °C (101 °F)
6. DECIDE		If the child or adult with diarrhoea is like this there is **no dehydration**	If the child or adult with diarrhoea has 2 or more of these signs there is some **dehydration**	If the child or adult with diarrhoea has 2 or more of these *danger signs* there is **severe dehydration**

salts in one litre of clean drinking-water and stir to make a solution. This is commonly known as *oral rehydration solution*.

When packets of oral rehydration salts are not available, a rehydration solution can be made at home. The community health workers should be taught how to make such a solution. This is not always simple because it is important that the amounts of sugar, salt, and water are correct. As a general rule, 40 g of ordinary sugar and 4–5 g of common salt should be mixed in 1 litre of clean drinking-water. *It is extremely important to mix the sugar, salt, and water in the correct proportions.*

How to give the solution to the child

The prepared solution should be kept in a cool place and kept covered to protect it from flies and dust. Use the fluid on the day it is prepared. Throw away any fluid that was prepared the day before.

Small amounts of the fluid should be given to the child every few minutes. The best way is to give 2–3 small spoonfuls from a cup, wait 2–3 minutes, then give some more. In this way, the child is less likely to vomit. If he does vomit, wait 5–10 minutes, then give some more. *Vomiting is not a reason to stop giving the solution, unless it is severe and frequent.* In that case, the child should be taken to the nearest health centre.

For detailed instructions about how to make the solution, how much to give and how to give it, the trainer should consult the guidelines prepared by WHO.[1]

[1] *Treatment and prevention of acute diarrhoea. Guidelines for the trainers of health workers.* Geneva, World Health Organization, 1986, 35 pp.

Feeding during and after diarrhoea

Many people think that all foods should be avoided during diarrhoea, because foods will make the diarrhoea worse. *This is wrong.* Foods are needed to replace what is lost during diarrhoea.

If a child with diarrhoea is on breast milk, the mother should continue to breast-feed him. Breast milk is safe, clean, and nourishing. Breast milk should be given between drinks of oral rehydration solution.

> Never stop breast-feeding during diarrhoea.

If the child is on cow's milk or artificial formula, the feeds should be diluted to half-strength with clean water. Such feeds should be given between drinks of oral rehydration solution. Full-strength milk should be started again when diarrhoea stops.

If the child normally takes solid food, he should be given soft, easily digestible foods (porridge, etc.) during diarrhoea. Small frequent meals should be given between drinks of oral rehydration solution. Feeding a child who is ill requires extra patience, time, and care.

After recovery from diarrhoea, extra food should be given. Try to give a little more than the child normally eats. Small feeds in between the main meals is also a good approach.

How to involve parents and other members of the family in the treatment of a child with diarrhoea

Explain to the parents and other members of the family in simple words what diarrhoea is and how it can be treated. Tell them how you are examining the child and what are the signs of dehydration. Show them how to prepare the rehydration fluid and ask for their help in its preparation. Once the solution is ready, taste it yourself and ask the parents to taste it also. They should notice that it is not as salty as tears.

Some mothers may fear that giving fluids may make the diarrhoea worse. Reassure them and explain that the water lost from the body should be replaced. If this is not done the child's life may be in danger.

Encourage the mother to use a cup and a spoon to feed the solution to her child. Teach the parents everything they need to do to care for a child with diarrhoea; a flip-chart may be useful for this.

Provide the mother with packets of Oral Rehydration Salts. If the diarrhoea is severe and the home is far away, give the mother more than one packet. She should use these until her child is completely well or until he is seen by you again. Advise the mother to bring the child back if his condition gets worse, if vomiting becomes severe, or if he cannot drink. If possible, the mother should always bring the child back the next day. This is to make sure that the child is getting better and to repeat the teaching about rehydration, feeding and prevention of diarrhoea.

Explain to the parents the importance of feeding during diarrhoea. Only when they see that giving properly selected foods does not worsen diarrhoea, they will be convinced.

How to prevent diarrhoea

Breast-feeding protects against diarrhoea and other infections. It also provides excellent nutrition. Do not bottle-feed. Bottles are difficult to clean and germs grow easily in the artificial milk formulas. Diarrhoea is common in bottle-fed children.

> Breast-feeding is the best way to prevent diarrhoea in infants.

Diarrhoea germs come from stools. If stools are passed where people cannot come into contact with them, the germs will not spread to others. Latrines should be built, used, and kept clean.

Dirty hands cause diarrhoea. Wash hands with soap and water before feeding a child, preparing and serving food, and after passing stools. Fingernails should be kept clean.

Stale food can cause diarrhoea. Freshly cooked food is clean. Preserve food by covering it completely and keeping it cool. Food prepared early in the day or the day before may be contaminated by germs. It should be cooked again before being given to children.

Dirty water can cause diarrhoea. Water for drinking must be clean and should be kept in a special pot with a cover. Never put hands in drinking-water. Drinking-water for small children should be boiled.

Flies can carry the germs of diarrhoea. Flies settle on stools, pick up germs and then settle on food. Cover food to protect it from flies. If children pass stools near the house, the stools should be removed and covered with earth.

Keep the house and surroundings clean and there will be few flies.

Infectious diseases and the body's defence against them

Many diseases are spread by germs which can cause infection. Germs are very small creatures that cannot be seen with the naked eye. Germs are around us everywhere—in the air, in water, and on nearly everything we touch, even on our skin. Some germs are harmless, but others are harmful and cause disease.

Dangerous germs can pass from one person to another in different ways. If someone has a disease in his chest or throat, he coughs. When he coughs, germs go into the air. If someone else breathes them in, he may also develop the same disease. Tuberculosis and measles are passed on in this way. If someone has diarrhoea he may pass many germs or parasites in his stools. If the stool comes into contact with water, the water becomes dirty, and when someone drinks this dirty water he may also get diarrhoea. The diseases that are passed from person to person are called "*infectious diseases*" (they are sometimes called "communicable diseases").

The body can fight infections in many ways. The skin keeps out many germs, and fluids from the nose and throat catch and kill many others. The digestive juices kill many germs that are swallowed. There are also very special mechanisms that work against specific germs. For example, if a child suffers from measles and recovers, he will never get measles again. During the illness the body has made a substance that kills measles germs; this remains in the body and if, later in life, measles germs attack again, the special substance will kill them. This person is protected and is said to be "*immune to*" or "*immunized against*" measles. In childhood everyone has many infections. While overcoming the infection we become immunized and protected against attack by the same germs in the future. Unfortunately, in the case of colds and diarrhoea, for example, one attack does not give a life-time protection. People, and especially children, can have repeated attacks of diarrhoea.

How infectious diseases affect nutrition

Measles, for example, is an infectious disease that attacks children mainly when they are between 9 months and 5 years of age. In some countries it is an important cause of death among young children. Measles germs travel through the air from a child who has the disease to another child who is not protected against measles. Some children become very ill with fever, rash, sore mouths, bad cough, fast and difficult breathing, diarrhoea, and sometimes unconsciousness. Usually the fever becomes less some days after the rash appears, and the child gradually recovers. During recovery the rash disappears. Sometimes the top layer of the skin peels off in small flakes.

Measles is a common cause of malnutrition. The fever and illness make the child lose his appetite, and he also refuses food because his mouth is sore. During fever the child uses more energy than normal, but because little food is being taken in, the body has to use up its own tissue (food stores) for energy. A number of children with measles also develop diarrhoea. In some countries people believe that it is harmful and wrong to feed a child who has measles and so children may be starved for days or weeks. It is not surprising, therefore, that many children with measles lose a lot of weight and become malnourished. This can be clearly seen on the growth charts of children who have had measles. Many children die because of the combined effects of measles and malnutrition.

> The body needs more energy in fever.

Fig. 36 illustrates how infection increases malnutrition at the same time as the malnutrition makes the infection worse. To break this circle of illness, it is necessary to treat both conditions; treating only one of them gives poor results.

There are many infectious diseases where a good diet is as important as medicine. Malaria, tuberculosis and whooping cough are some examples.

> Malnourished children get more infections which are more severe and last longer.

Dietary management in infectious diseases

As in diarrhoea and measles, a good diet is essential for restoring the health of the child. Most often, a sick child is starved, because the

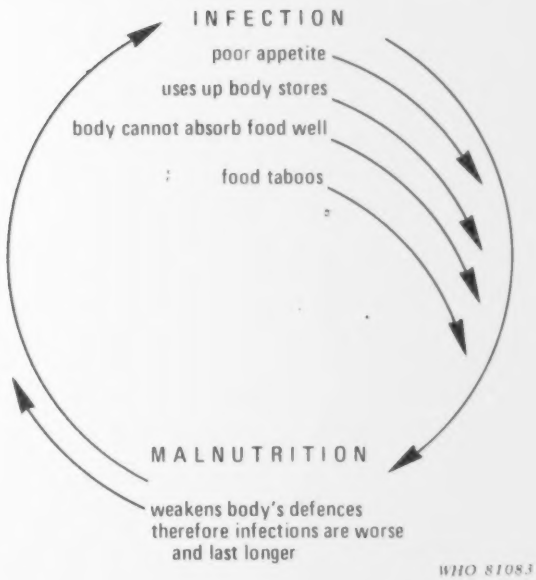

Fig. 36. The circle of infection and malnutrition

parents think that foods will make the condition worse.

> Proper diet is the best general measure in all infectious diseases.

In most infectious diseases, proper diet is the best treatment. It may not be easy to feed the child at first, because the child may have a sore mouth and no appetite. The parents and other relatives taking care of the child will also need to be gently persuaded to help feed the child. Cooked cereals of soft consistency, peas and beans cooked well, potatoes, carrots and non-fibrous vegetables well cooked, oils or butter, and milk if possible, are suitable foods. As a rule a *small quantity of food should be given often*. Firm persuasion and much patience may be needed to feed the child. However, this is very worthwhile, because correct feeding is the best way to help him overcome the disease.

Give plenty to drink. Apart from food, an adequate fluid intake is *important*. This is particularly necessary for a child with fever who sweats a lot. The importance of fluids in diarrhoea has been described earlier. Other general treatments attempt to relieve discomfort and bring down fever. Half a tablet of aspirin or paracetamol given with food and fluid four times a day is helpful in bringing down fever in small children. Appetite returns with the lowering of body temperature.

The treatment of any infection is not complete until the patient begins to eat normally. The best measure of nutrition during and after an illness is the weight of the child. Nutritional improvement is shown in two ways:

- The child's weight should be more than it was before illness, and
- The growth line on the chart should be going upwards.

Until there are these signs of nutritional recovery, the child should receive extra food. This food can be an extra meal each day or an extra helping at each meal or small feeds in between meals. This is an essential part of the treatment. *Proper feeding is as important as giving any medicine*, and it is more important than giving any health tonic.

Prevention of infectious diseases

Most common and serious infectious diseases can be prevented. There are two main ways of doing so:

- By decreasing the chances of individuals or the community coming into contact with the germs or parasites
- By improving the defences of individuals so that, if they are infected, the germs cannot cause disease.

The first method is really *improving the environment*, or the area in which people live. For example, if everyone uses latrines, has plenty of water to wash with, and throws rubbish away in a protected pit, the environment will be clean, then there will be little chance of getting germs from someone with diarrhoea, for instance.

The defences of an individual against infections can be improved in a general way or in specific ways. *A better state of nutrition means that a child's defences can function fully against any infections*. This is a general improvement.

> Good nutrition means good defence against infections.

An improvement of the defences against specific infections can be achieved by immunization. It was explained on page 105 how a child who has had measles once becomes protected against the disease by a special substance that his body makes. This is called "*natural immunization*". It is also possible to produce "*artificial immunization*". This is done by

injecting "weakened" germs into the body. These germs attack the body but are not strong enough to produce the signs of the disease. However, they do cause the body to produce the special substance that kills the disease germs and thus protects the body from future attacks. *A substance which can produce specific artificial immunization is called a "vaccine".* There are a number of valuable vaccines which can immunize and protect against infections.

Breast milk contains protective substances against the germs that cause diarrhoea and some other infections.

> Breast milk increases the body's defence against infections.

Immunization programmes and use of vaccines

There are a number of vaccines that can give immunity against diseases. These are very valuable in protecting children against dangerous diseases of childhood. The vaccines are made and given in different ways and have to be given at about the right age for the best effect. Immunization also needs to be repeated at certain intervals.

There are six important and common diseases for which there are vaccines. These diseases are: *measles*, *tuberculosis*, *whooping cough*, *diphtheria*, *tetanus*, and *poliomyelitis*. The vaccines are given in a particular order, at specific ages and are repeated at appropriate intervals of time. The vaccine schedule may differ slightly from one country to another. Not all countries are able to offer every vaccination in their programmes yet. Although immunization schedules vary from country to country, this one is typical in the developing world:

- *For tuberculosis*, immunize with BCG at birth
- *For poliomyelitis*, immunize from 6 weeks of age: 3 doses at 4-week intervals
- *For DPT* (diphtheria, pertusis and tetanus), immunize from 6 weeks of age: 3 doses at 4-week intervals
- *For measles*, immunize from 9 months of age
- *For tetanus*, immunize pregnant women and women of child-bearing age to protect the newborn from neonatal tetanus: 2 doses.

The trainer should first find out the dosage and time-schedule being followed in the national immunization programme.

The importance of the community health worker in the immunization programme

The community health worker has great responsibility in an immunization programme. Its success depends very much on her. She is the person who has to persuade the people that immunizations are worth while. Whenever she finds that the growth line on the growth chart of a child has come down after an infection, she should try to convince the mother regarding the advantages of immunization.

First, she has to explain the importance of the programme to the community and convince the community leaders in particular. With their help, she must identify all the children of the right age for vaccination and convince their parents of the need to have the children vaccinated. The willing participation of the parents and leaders is important, because the community health worker will need help to get the children to the vaccination centre at the right time on the right day, and to bring them back again for their second and third vaccinations at the correct intervals.

Communities benefit from immunization programmes in two ways. First, immunizations prevent both infection and malnutrition. Secondly, the programme gives an opportunity to the community to participate collectively in its own health care.

> - Start the vaccinations early in the first year.
> - Try and complete the series of injections.
> - Make sure the malnourished children are vaccinated, they are a priority group.

TRAINING METHODS

1. *Lecture*: Training content.
2. *Demonstration and practical work*: Preparing oral rehydration fluid with various household measures.
3. *Group discussion*: Common feeding practices in the community during diarrhoea and infectious diseases.
4. *Role-playing*: Advising mothers about immunization and use of oral fluid in diarrhoea.

EXERCISES

Exercise 1. Growth charts of children with diarrhoea

Ask the trainees to visit a community and bring back some growth charts of 5–10 children who have had diarrhoea, or ask them to draw such charts themselves. They should note what happened to the children's weights when they had diarrhoea and discuss the reasons why the weights dropped. They should consider what can be done to improve the situation in the families concerned.

Exercise 2. The litre and household measures

It is important that each standard packet containing 27.5 g of Oral Rehydration Salts should be mixed into 1 litre of water—not less than a litre nor much more than a litre. But it is not easy to judge how much water makes 1 litre when it is poured into household vessels of different shapes and sizes. Also, it is difficult to know what amount of salt or sugar weighs a given number of grams. This exercise will give community health workers practice in judging quantities. They should do this exercise while they are training and repeat it often when they are working on their own in the community.

Obtain a measuring vessel on which an exact 1-litre quantity is marked. See which local vessels hold 1 litre by pouring water from them into the 1-litre measure until the level reaches the 1-litre mark. Pour a measured litre into the household vessels and place a mark on them at the level the water reaches. Trainees can have competitions to see who can guess which local vessels most nearly hold 1 litre. They can also guess the level at which the 1-litre mark should be placed on those vessels.

Provide the trainees with an accurate weighing balance, salt and sugar in the form used locally, and a number of locally available small containers (large and small spoons, bottle caps, cups, etc.). Let them practise weighing given quantities of salt and sugar and ask them to find out what weight of each the containers will hold.

Use smaller vessels for smaller packets!

The standard packets used in some countries may contain a smaller quantity of oral rehydration salts that is meant to be diluted in less than 1 litre of water. For example, some countries use smaller packets that should be diluted in $\frac{3}{4}$ litre or $\frac{1}{2}$ litre of water. In these countries, use smaller vessels for this exercise.

REMEMBER!

- It is dangerous to use a solution in which the concentration of salts is too strong.
- It is safer to use a solution which is more dilute.

Exercise 3. Role-playing

There are many suitable variations. The trainees can make up some from their own experience of difficult situations. Here are some examples of difficult situations that can be used in role-playing.

(1) A mother does not want to give her child oral rehydration solution because he has vomited.
(2) The grandmother of a child says that the mother should not breast-feed the child because he cannot digest the milk when he has diarrhoea.
(3) The parents of a child with diarrhoea come asking for an injection to make the child better.
(4) A man has built a latrine for his family. His neighbour laughs at him. The child of the family with the latrine is healthy but the child of the neighbour gets diarrhoea.

Exercise 4. Gaining experience in diagnosing and managing diarrhoea

In order to gain experience in diagnosing and managing diarrhoea it will be useful for the trainees and the supervisor to visit a clinic where many cases are seen daily.

The supervisor will demonstrate the signs of dehydration in a child with diarrhoea. The trainees should look for these signs in other children attending the clinic and practise observing children with diarrhoea.

Exercise 5. Local beliefs and practices regarding diarrhoea

During field training, each trainee should each visit 2 or 3 families and inquire about their beliefs about diarrhoea, factors which influence the condition, and how they manage it at home. The trainees should also note the families' reactions to the recommendations about treating diarrhoea by oral rehydration. All the trainees can then share their experiences and discuss how to make oral therapy acceptable in the community.

Exercise 6. Observing the feeding practices during infectious diseases

The trainees should form small groups and visit at least ten households for each group. They should observe and record the following:

1. The common diseases in these households during the last one month.
2. How the children were fed during such diseases—whether completely starved, some foods given, or fed normally.
3. Why the mothers feel that all foods should be stopped during illness.
4. If some foods were not given, what were the reasons?
5. What are reasons for the feeding practices they follow during illness?

In a group discussion, this information should be presented by each group and discussed.

Exercise 7. A quick study of the infectious diseases in a community

The trainees can divide a village or community up into streets or areas. Each trainee visits all the houses in one street or area. In each home she should quickly

inquire about the infectious diseases there have been in the last month. She should ask especially about diarrhoea, measles, whooping cough, fever (malaria), and tuberculosis.

When the trainees have visited all the houses in a village they should add up all the cases of the different infectious diseases they found in their survey. This information should then be discussed by the trainees. Some important points they should consider are: Is this information accurate and complete? If not, why not? In what ways will this information help with the work of a community health worker? Is it necessary to learn more about the treatment and prevention of particular diseases that are important in the community?

A quick survey of this sort will indicate which infectious diseases are common in the community. Some people may be offended by questions about the health of their family, or they may not want to talk about certain diseases. Some communities will be very sensitive about such questions; therefore, this exercise needs to be planned carefully before it is started. It will be helpful for the trainers themselves to act in role-plays about how to approach the community in such a survey.

Exercise 8. Observing the community environment

The trainees should form small groups and make a tour of the area in which the community lives. They should observe as many things as possible that make the environment dirty and point out these things to each other. Afterwards the groups should come together and compare their observations. Finally, the trainees should discuss what can be done to make the community environment cleaner for better health.

MODULE 8

CONVEYING NUTRITION MESSAGES TO THE COMMUNITY

LEARNING OBJECTIVES

After studying this chapter, taking part in the discussions, and doing the exercises, a community health worker should be able to:

- Understand the need to impart simple messages to the community to help the people to adopt better health and nutrition practices
- Identify people in the community, either individuals or groups, who need special help to improve their nutrition
- Identify specially motivated people in the community who might assist her in conveying suitable messages to those who are in need of special help
- Select suitable messages according to the problem, and convey these in a simple and convincing manner.

TRAINING CONTENT

Need for nutrition education

In the previous modules, mention was made of the need to teach mothers how to feed infants and children properly, how to care for a child with diarrhoea, and how to feed a child with diarrhoea or an infectious disease. In other words, community health workers are expected to convey suitable messages to the people in the community in an appropriate manner so that the people adopt correct practices regarding feeding, immunization, cleanliness, etc. This is called nutrition education. It is an important task of community health workers.

It should be remembered that mothers are always keen to improve the health and nutrition of their children. Unfortunately, many of them do not know how to do this. Moreover, in poor communities there are other problems such as an unhygienic (dirty) environment, lack of clean water, and shortages of food at some periods of the year. Community health workers should understand these problems and should be able to teach mothers ways of overcoming them.

In all cultures there are some beliefs and superstitions about foods and food habits, especially with regard to the feeding of young children and foods during pregnancy and lactation. The community health worker should know what beliefs and superstitions are common in her community. It is her responsibility to convince people to give up wrong beliefs. At the same time, she should teach people good health and nutrition practices.

In all communities there will be individuals and groups who will require special nutrition and health care (see Module 6). It is the duty of the community health worker to find out who these people are (see Module 1). She should then make an extra effort to convey appropriate nutrition messages to such persons.

Motivated people in the community who can help in nutrition education

A community health worker cannot improve the nutrition of a community by herself. She needs all the help she can get. In every community there are persons and groups who are helpful. In Module 1, mention was made of the need to know such persons or groups. These persons may be either officials of a particular branch of the government or informal leaders, e.g., the village head man, a teacher in the village primary school, a religious leader, or a traditional birth attendant or healer respected in the community. Voluntary agencies and women's groups are often active and eager to help. The community health worker should identify all the helpful individuals and groups (resource persons) in the community and establish good relationships with them before starting her work. This is not only important for her nutritional tasks but also for all her activities in health care.

When a community health worker makes an effort to change the dietary habits of the people through suitable messages, her task will be much easier if her messages are supported by the community resource persons. If the village leader is convinced that a certain message is good for the community and he gives his approval and support, this will make the members of the community more receptive to that message. Similarly, if the school teacher starts telling people about the benefits of good nutrition practices, the efforts of the community health worker will produce better results. Before trying to convey nutrition messages, it would be wise for the community health worker to discuss these with some of the community resource persons.

Conveying health and nutrition messages

Nutrition education is not so easy as many people think. This is because it is not easy to change people's eating habits. If a community health worker tells a mother to feed her child in a certain way and the mother listens to her advice, it does not mean that the mother will actually start doing what the community health worker has told her. To convince mothers to adopt better nutritional practices, the community health worker must first understand why people follow particular feeding practices. Often, the reasons for the feeding habits of the families will be linked to factors such as: poverty, cost of foods, availability of foods, beliefs and superstitions about foods, and time available to the mother for preparing food.

> Before starting nutrition education understand *why* people follow particular feeding practices.

Once the community health worker has understood the reasons for people's feeding habits, she can start nutrition education. The following simple rules will help in getting good results.

Person-to-person discussions

- Talking with one mother at a time (person-to-person approach) is an effective way of conveying a message.
- Talking to a mother, when her child is not well and she needs help, is a good time to convey messages.
- Not more than one or two messages at a time should be discussed.
- The messages being conveyed should not go against the mother's culture or religion.
- While conveying a new message, it is always useful to mention some common beliefs and practices prevailing in the community that should be encouraged. For example, in many cultures, a religious-cum-social function is held to introduce solid foods to a six-month-old baby to initiate the adult-type of diet.
- Do not give any message that mothers cannot follow for other reasons, (poverty, religion, illiteracy, lack of knowledge, etc.).

Group education

Community health workers will get many opportunities to talk to a number of mothers together. On such occasions they should try to convey nutrition and health messages to them. In doing so, they can use teaching aids such as posters, flip-charts, and photographs. Sometimes, slides and even films may prove useful.

A child who has recovered from malnutrition as a result of a good diet composed of cheap locally available foods can be a very convincing example to use in such group discussions, especially if the mother of the child also explains how the diet was changed and why and what improvements she noticed. "Before and after" pictures of local children will also be useful in starting discussions. Similarly, growth charts can also be used.

In countries that have nutrition rehabilitation centres, the mothers of malnourished children are sometimes asked to help in preparing food for children at the centre; they may also be asked to help in feeding the children. This is a good practice because such mothers become convinced about good nutrition practices once they see their own children healthy again. Community health workers can ask these mothers to help in group discussions.

Some other useful hints about nutrition education

Catch the attention and interest of the mothers. If a woman has asked a question about her child, you have a good opportunity because she will be interested in your reply. Look for something about which you can compliment her. For instance, is her home tidy, is her child washed and clean, and is she breast-feeding her child? It may also be worth while to see if the growth chart of her child shows regular weighing and completed immunizations. The mother gets the feeling that personal interest is being taken in her child and family and she will listen carefully to what you have to say.

The message should apply to the mother's situation and to her hopes and desires. If her child has fever, the first message should be about how to reduce the temperature. Only afterwards will she listen to what you say about feeding children who are ill. Motivation and acceptability of a message depend on the immediate needs and desires of a mother.

The message should be simple. Try to put across only one or two ideas at a time. The ideas should be closely connected to something the mother already knows.

The message should be heard, seen, and understood. Speak clearly and use simple words. Whenever possible, use pictures etc., to show what you are talking about. This is important with different types of foods. Mothers will understand the messages more easily if simple examples are given.

Participation. It is easy to forget what has been said or seen, but doing something helps to remember it. What is even better is to show someone else how to do something. If a child is not growing well and a mother is told to give him extra food each day, she may not remember it. If the community health worker encourages her and helps her to get started, the mother may give the child the extra meals regularly. As the child's growth improves the mother will feel proud and happy at what she has achieved. She will remember the importance of more meals for small children. If the child was simply sent off somewhere for an extra meal twice a day promoted by a feeding programme, the mother will never really know about the importance of extra meals.

A local proverb or a joke can make it easy to remember a message. "A small seed, if properly nourished, grows into a mighty tree". It is obviously necessary to use a proverb correctly. It is important not to offend people. Understanding and judgement are necessary when making jokes in another language or in a culture different from one's own.

Repetition reinforces a message. After telling a mother something, it is useful to ask her to repeat the message and explain it in her own words. This will help her to remember it. The test of her understanding will be to see if she carries out the instructions in her own home.

A friendly and respectful relationship is a great help when teaching or learning. A welcoming smile and a helpful deed are a good beginning for exchanging information. An arrogant attitude will create barriers to learning.

Organizing and taking part in meetings to consider nutrition matters

Every culture has some form of gathering where people discuss matters of common interest. Sometimes all important decisions are made at such meetings. There may be different meetings for different groups, for example, young farmers, mothers, community leaders, and so on. Various aspects of nutrition could be discussed at these meetings. If there is no suitable group or meeting to discuss nutrition and health, the community health worker may have to start one.

> Discuss nutrition problems in community gatherings.

Every meeting should have a definite objective, and for each objective a list of topics should be prepared. Both the objective and topics should be known to the people attending the meeting. The community health worker should prepare teaching methods and aids suited to the topics that will be discussed at the meeting, because it provides an important learning opportunity. She should collect together materials which can illustrate the topics being considered: for instance local foods, weighing scales, and growth charts.

She should make sure that the leaders of the community are invited. This means not only

the official leaders, but also those who are looked upon for guidance by others in the area. If possible, she should have the meeting led by someone who will understand the social, economic, and health issues associated with nutrition problems, someone who is respected by others and not afraid of change.

The meetings should follow the local pattern, but an effort should be made to keep them informal. The community health worker should be prepared to take an active part. She can ask questions and make comments that will keep the meeting going in the right direction. The purpose of such a meeting is to keep nutrition and health issues in people's minds. It is an opportunity to inform them about other factors that affect health. The most important purpose, however, is to stimulate the people in the community to be active and to do something about their nutritional problems. Here you may use the approaches suggested on page 00. What is needed is personal and community commitment to make changes that will improve the nutrition and health of the high-risk groups. This is not an easy task, and very quick results should not be expected. Patience and persistence will be necessary.

TRAINING METHODS

1. *Lecture*: Training content.
2. *Group discussion*: Organize an education session in the community for trainees to practise their communication skills.
3. *Demonstration*: Use of various teaching aids.

EXERCISES

Exercise 1. Preparation of messages

The trainees should prepare some basic messages relevant to each of the previous seven modules and suitable for the community in which they are expected to work. They should also prepare some points regarding how they are going to convey each message.

Each trainee should present her messages and points to the class, and the other trainees should comment.

Exercise 2. Role-playing

Characters: A mother with a 9-month-old baby whose weight is not increasing.
A community health worker.

The community health worker should convince the mother that the child needs solid foods, but the mother insists that she has sufficient breast milk and the child is quite healthy.

MODULE 9

SOLVING NUTRITIONAL PROBLEMS IN THE COMMUNITY

LEARNING OBJECTIVES

After studying this chapter, taking part in the discussions, and doing the exercises, a community health worker should be able to:

- Understand that a number of activities are generally necessary to solve one nutritional problem because nutritional problems often have many causes.
- Identify the major causes of malnutrition in a child, select the causes that she can deal with, and carry out appropriate tasks to remove those causes.
- Convince parents that regular weighing of children is necessary to know what actions are required at different ages so that the child grows well.

A SPECIAL NOTE FOR THE TRAINERS

Each of the 8 previous modules gives all essential details about one particular task, including how it should be done, why it should be done, and how to acquire the skills necessary for doing it. Each of these tasks will considerably improve the nutritional status of members of a community, if these are done well by the community health worker.

In this module, the attention of the trainees is drawn to the fact that in doing actual work in the community, they will have to combine various tasks to solve nutritional problems. For instance, when a community health worker visits a family, she will not only monitor the growth of the child, but on the basis of the child's growth pattern, give advice to the mother about proper feeding practices; if the child is suffering from diarrhoea, she will also have to advise the mother on rehydration and proper feeding during diarrhoea and during the days after the diarrhoea is over so that the child gains back the lost weight.

Thus, to solve a nutritional problem the trainee will have to follow three steps:

- Identify and understand the cause(s) of the problem;
- Select the appropriate task(s) from all the tasks she has learnt;
- Carry out the selected tasks as best as she can.

This module should help trainers to convey the above ideas to the trainees.

TRAINING CONTENT

Tasks to be done to solve nutritional problems

Once a community health worker has studied the preceding modules and has done all the exercises contained in them, she should be adequately trained to carry out specific nutrition-related tasks. However, the ability to do specific nutritional tasks by itself is not enough. The community health worker must also have a broad understanding of the causes of nutritional problems. The example below will illustrate this point.

When a community health worker visits a family and finds a badly nourished child who has not been gaining weight for 2–3 months, she must find out the causes for the child's malnourished state. To do this, she must immediately remember all the important causes of growth failure and should not simply think of defects in feeding. In Module 7 the community health workers learned that diarrhoea and infections can cause malnutrition. It should be noted that these are the commonest causes of malnutrition in the community. If the child being examined has diarrhoea, the community health worker will have to advise the parents about how to prevent dehydration, how to feed the child during diarrhoea, and how to prevent the recurrence of diarrhoea. Also, if the child is not immunized against common childhood infections, the community health worker will have to persuade the parents to have the child immunized.

On the other hand, if the child does not have either diarrhoea or any other infection, the reason for his growth failure may be inadequate care and feeding. In such cases the community health worker should find out why the child is not being properly fed. The reasons can be many. It may be that the mother is pregnant again and feels too tired to look after the child properly. She may herself be malnourished or anaemic. She may also have a number of other children or she may be working outside and may be leaving the child in the care of an older brother or sister.

Thus, in solving nutritional problems, the community health worker has to remember that each nutritional problem has several causes (and not just one as conveniently described in each module). The community health worker, therefore, must first understand the problem and identify the possible causes. Then she must decide what tasks have to be done to solve that problem. In doing so, she must remember the following points:

- The major causes of nutritional problems are often ignorance on the part of mothers, diarrhoea and other infections, and inadequate child care as a result of ill health or malnutrition of the mothers.
- The community health worker should carry out all the tasks that seem appropriate in her attempts to solve nutritional problems.

Community health workers will not be able to solve all the nutritional problems in a community. For example, it will be difficult for them to help an orphan child or children of very poor parents. In such cases they are advised to get in touch with community leaders or other workers from different sectors (social workers, nearby charitable organizations, etc.) to see what can be done for such children.

Fig. 37 gives an example of steps to be followed in solving the nutritional problem of a child who has not been gaining weight for 2–3 months.

Tasks to be done when there are no nutritional problems

Regular weighing of *all* children is essential even when they are gaining weight normally. In the case of children who are growing well, the community health worker should:

- tell mothers that as children grow older they need more food and that by one year of age they should start eating from the family pot;
- teach mothers how to avoid diarrhoea and other infections by washing their hands often, boiling water for children, giving children cooked food, and using clean utensils;
- convince parents to get their children immunized in order to prevent the occurrence of diseases and malnutrition.

Growth monitoring for establishing contact with the community

Look at Fig. 37 again. Note that the main problem of the child in the example is that he is not growing properly. This problem can be identified only by regular weighing. After this is done, several other tasks must follow, as is pointed out in the example in Fig. 37. It is important to remember that weighing a child and using a growth chart are not the only two

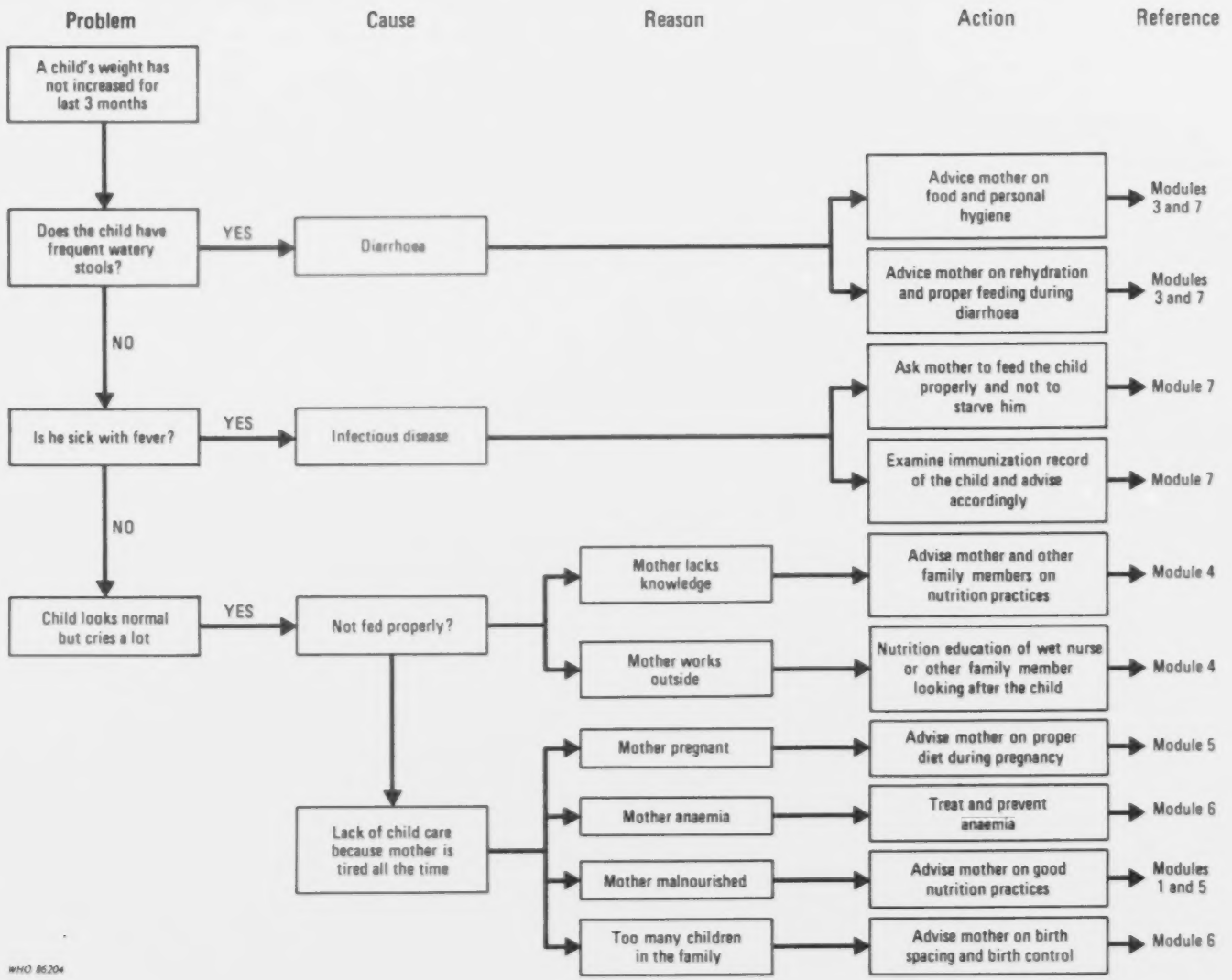
Problem
Cause
Reason
Action
Reference
A child's weight has not increased for last 3 months
Does the child have frequent watery stools?
YES
Diarrhoea
NO
Is he sick with fever?
YES
Infectious disease
NO
Child looks normal but cries a lot
YES
Not fed properly?
Lack of child care because mother is tired all the time
Mother lacks knowledge
Mother works outside
Mother pregnant
Mother anaemia
Mother malnourished
Too many children in the family
Advice mother on food and personal hygiene
Modules 3 and 7
Advice mother on rehydration and proper feeding during diarrhoea
Modules 3 and 7
Ask mother to feed the child properly and not to starve him
Module 7
Examine immunization record of the child and advise accordingly
Module 7
Advise mother and other family members on nutrition practices
Module 4
Nutrition education of wet nurse or other family member looking after the child
Module 4
Advise mother on proper diet during pregnancy
Module 5
Treat and prevent anaemia
Module 6
Advise mother on good nutrition practices
Modules 1 and 5
Advise mother on birth spacing and birth control
Module 6
WHO 86.204

Fig. 37. An example of steps to be followed in solving a nutritional problem in the community

tasks in growth monitoring. They are the first two tasks in a series of tasks necessary for preventing health and nutritional problems in the community.

Community health workers will need the support and cooperation of the community in their work. This was mentioned in Module 1. The relationship between a community health worker and the people she serves should be such that the people have confidence in her. Once such a relationship is established, the community health worker's task of convincing people about such things as family planning, immunizations, and use of oral rehydration solution will become easier.

A good way to establish a relationship of confidence with people in the community is by growth monitoring. First, regular weighing of children will increase contact between the community health worker and mothers. This will enable the community health worker to establish a friendly relationship with the mothers. Second, by regularly recording weights on growth charts the community health worker will be able to identify malnourished children early. Then by doing all the tasks she has learnt she will be able to help any malnourished children recover quickly. And when parents see that their children are gaining weight again and are growing well, they will have more and more confidence in the advice of the community health worker. Thus, growth monitoring should be the first task of a community health worker, after she has got to know the community.

TRAINING METHODS

1. *Lecture*: Training content.
2. *Community survey*: Identification of malnourished children and the major causes of their malnutrition.
3. *Group discussion*: Findings of the community survey.

EXERCISES

Exercise 1. Identifying malnourished children in the community and determining the causes

The trainees, in small groups, will visit 10 households, and using a weighing balance and growth charts, make a list of all children under five years who are malnourished. For each malnourished child, the possible major causes should be listed. In a group discussion, the tasks which can be undertaken for each major cause will be suggested and their suitability discussed.

Exercise 2. Role-play concerning the use of the growth chart in motivating the mothers to accept other advice

Characters: A mother with a malnourished child
A community health worker

The mother regards the reduction in the weight of her baby as something natural that happens to all children. She does not understand how this is related to the need for immunization and other activities. The community health worker tries to convince her that the chart often indicates what needs to be done to keep her child healthy and strong, and that she is there to help the mother do what is necessary.

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